COMPUTERWORLD

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An Wang approved a decision to ship Wang Laboratories products to South Africa in 1986 through a conduit, despite his own claim to have terminated all business with

that nation. Page 2. Uccel's integrated banking nackage will ship almost two years late. Page 4

The DPS 8000 line succeeds the DPS 8 amid Honeywell Bull announcements that include a relational DRMS

Page 8. Tariffs continue on 16-bit micro imports from Japan de-

some easing of U.S. trade sanctions. Page 93. Network vendors race to link up IBM's PS/2 machines

Page 49. Manager of Intel's add-in board division evaluates expansion capabilities of the PS/2 line. Page 39.

Connectivity and 9370 are expected to highlight an IBM announcement on Tuesday. Page 6.

BULLETIN: RYE BROOK, N.Y. - IBM

last week advanced the delivery for two of its most powerful systems, the 3090 Models 600E and 300E, by saying both machines will be available in June. IBM had planned to ship the systems and upgrades from existing models in the third quarter

IBM launches production-oriented VM/XA

Environment gears mainframes to end users, adds full support for multiple operating systems

BY DOSEMARY HAMILTON

RYE BROOK, N.Y. - Taking an mitial step toward providing a true user-oriented environment for its largest processors, IBM last week announced VM/Extended Architecture System Product, a high-end VM operating system that will supersede current VM/XA offerings.

est in a series of VM introductions made during the past year that show IBM's intent to position VM alongside its MVS as the strategic operating systems of the future. The introduction also addresses one of the remain ing major flaws of VM by offering a production-oriented operating environment on the company biggest systems to replace the

The announcement is the lat-

marily used for support of guest operating systems and develop-

VM/XA SP, scheduled for release in March 1988, reportedly includes some of the major pieces - such as an enhanced Conversational Monitor System - needed to provide an enduser-oriented operating system that will for the first time take

current VM/XA, which is profull advantage of XA hardware. which includes IBM's 3090s 3080s and 4381

It is a turning point toward a more cohesive environment Continued on page 7

Users rate their

mainframes IBM ranks kuch on reliability among users surpried in annual ro report - full story page 55

CBM 4381 CBM 3080 serv Unavys A 3/A 5 IBM 4361

meywell DPS 8

Sale of D&B's Nomad2 imminent

BY ALAN ALPER

NEW YORK - Thomson S.A. of France is negotiating to acquire D&B Computing Services' Nomad line of fourth-generation

Shh! PS/2s to ship out diskless

BY DOUGLAS BARNEY

IBM is quietly making a diskless version of its Personal System/2 Model 30 available to at least one large corporation, while some firms are using the Model 30 equipped with disk drives to replace terminals

According to sources within the company, American Airlines will be using diskless IBM Model 30s as part of its Sabre reservation system and will be installing the machines in travel agents of fices during the next few years. Joe Stroop, a spokesman for American Airlines, refused to confirm or deny the report. As of press time. IBM was unwilling to

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language productivity tools. Computerworld has learned. The Dun & Bradstreet Co.

D&R Computing's parent company, has sought a purchaser for the Nomad line since early this year [CW, May 25] and will spin off D&B Computing's remaining tune-sharing and maintenance operations as a separate business unit if the acquisition is completed, sources said.

D&B Computing is believed to have a preliminary agreement with Thompson but is religious to publicly disclose the deal until terms are completed sources knowledgeable of the negotia

France confirmed the negotia-A D&B Computing spokes

woman said it is company policy not to comment on reports related to mergers and acquisitions The purchase price of Nomad chnology is estimated in the \$15 million to \$20 million range. sources said. Dun & Bradstreet is believed

because it does not fit with the firm's information services thrust. In addition, Wilton, Conn.-based D&B Computing is Continued on base 6

CRISIS IN FOUCATION

Top students shunning MIS

BY GLENN RIFKIN

Thus is the first of a two-bart series

he burgeoning computer industry of the early 1980s brought with it a surge m MIS education Programs sprang up on

campuses around the country as interest in computer careers pared. But recently, the promise of MIS education has turned sour on America's campuses; the industry slump, coupled with a growing list of diverse and unsettling factors, is resulting in dechning interest in MIS as a career and cre-

ating a growing crisis in MIS education. There's a disturbing feeling that the om is off the rose. says Ephraim McLean, associate professor of information systems at the University of California at Los Appeles's Graduate School of Management

"There is the sense among students tha there is not a need for MIS professionals and that the action area is not in MIS but in fi nance. The feeling is that the MIS professional will go the way of the stationary engineer; that there will be some need for a few

people in the basement to run the big computers but that, in fact, it is not a very Sattractive career Although McLean, along with

MIS educators across the country vigorously disagrees with that scenamo undergraduate and graduate students across America seem to be embracing that perception. The conputer industry slump - although on the wang - coupled with the glamour and lure

of Jucrative Wall Street careers, is cutting dramatically into what was once a surplus good of talent for MIS "We're getting a stronger demand for our students from corporations than in the last two or three

Continued on page 120

9018* 110IO-S *******

BY CLINTON WILDER

oratories, Inc.'s use of a Florida

export firm to ship products to

South Africa in 1986 was an official corporate decision approved

by Chairman An Wang, the com-

cense to the racially divided na-

tion, grew out of concern for

Wana's South African custom

ers. Wang spokesman Paul Hen-

ning said. He added that the

company, after cutting its direct

tie with its Johanneshurg distrib-

utor in 1985, sought an indirect

way to continue supplying its

Wang shipped its products

Southern Star Trading

through Fort Lauderdale. Fla.-

Corp. to the South African dis

tributor, General Business Sys

terns (GBS), in 1986 [CW, June

81. "For 1986, we made the deci

Star agreement in order to ad

dress, in a commercially reason

able manner the immediate

sion to enter into the Southern

South African users

The decision, made after

pany confirmed last week

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Product parade. Honeywell Bull releases DPS 8000 line as follow-on to DPS 8 small mainframe family and rolls out an integrated relational DBMS, productivity tools for GCOS 8-based mainframes and models of the DPS 6 Plus mini. Page 8.

NCC news. Although the exhibitor list has been pared down, this week's NCC schedule is expected to include product announcements from IBM, Xerox and others, as well as a few joint marketing venture plans. Page 4.

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Shipments OK'd at top

South Africa deliveries approved by An Wang

needs of foreign customers who were then operating their busi-nesses with Wang commuters LOWELL, Mass. - Wang Lab

years." the company said in a corporate statement A transition period

Over a period of time, this was consistent with our policy of withdrawal from South Africa Wang surrendered its export li-Henning said. "It was a transition period, if you will, for our existing customers in South Afri-

> In Wang's 1986 autobiogra phy. Lessons, however, the company founder wrote that he had severed our last remaining connection to South Africa.

The estimated 2 500 Wang user sites in South Africa are still able to purchase Wang products from GBS, according to South African users and a U.S. governofficial recently interviewed by Computerworld. But Henning reaffirmed that Wang ended its remarketing agreement with Southern Star at the end of 1986 and is no longer the source of Wang computers sold by GBS

PDP-11/84 options to become standard

BY NINAMARY BUBA MAGINNIS

MAYNARD, Mass. - Digital Equipment Corp. is expected to announce by lone 30 a new con formestion of the PDP-11/84 that will repackage some options as standard offerings. Computersorld has learned

Functionality that was oncely available only with the BA11 backplane and DD11-DK expansion box will soon be availle in the CPU, sources close to DEC revealed. DEC engineers have redesigned the PDP-11/84 central processor to make it a more compact and functional system, sources said

The vet-to-be-approunced CPU design will offer more ex pansion capability in the base system and operate more economically sources and The new system will still allow additional expansion hoves and backplanes

to hang off of it, providing configuration flexibility and growth capacity, according to sources. There is an insatiable d mand for more and more PDP

11s, and this new configuration is largely based on feedback from PDP-11/84 users," source said. DEC refused to comment on the impending PDP-11/84 announcement, In addition, DEC also said it is now shipping Microvax II up-

grade kits for its Micro PDP-11 and Microvax I computers [CW. May 41. PDP-11/23 Plus, Micro PDP-11/23 and Micro PDP-11/73 users can also upgrade to the top-of-the-line Micro PDP-11/83, DEC said The PDP-11 system Micro

vax upgrade kits are priced from \$10,200 to \$11,750 Microvax system packages cost from \$13,400 to

\$22,400, depending on system configuration

CLARIFICATION

The Taking Charge column in this week's Management section (page 85) went to press prior to the announcement of the resignation of Richard Ferris, chair man of Allegis Corp., the parent company of United Airlines. Ferris, who had said he wanted to integrate United Airlines with Allegis's hotel and car rental businesses in a strategy relying heavily on information systems, resigned amid indications that Allegas would sell its hotel and car companies to concentrate on its airline business

ecs' nay hikes

IRM's hand in the manula turing process Page 69

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SYSTEMS & PERIPHERALS

55 Honeywell, Amdahl receive top grades in user sur-

55 Portable terminals gain acceptance in business. 55 Departmental cor ing ground fertile for IBM ompetitors.

Quotable

here is a whole lot of money riding on Unix not being successful.

STEVE JOBS Services page 19



hiring freeze here. A leaner budget there. And the work still has to get done. The message from corporate management is loud and clear. Do more. But don't spend more. You know what? Thousands of

You know what? Thousands of companies like Marriott Corp., Singer Co., Inc. and Becton Dickinson's Deseret Medical Division have MIS Directors who are working magic doing more without spending more. Using the same people. And the same computers. The difference is ADR* Performance Software.

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most problems in less than 15 minutes. ADR can unlock the potential hidden in your computers faster than you can say abracadabra. Call 1-800-ADR-WARE to learn how.

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American Offices Communications Company for the Term Pan Assertion Games

The Infoloans wait

Long-promised Uccel package now due late '88

BY ROSEMARY HAMILTON

DALLAS - Licel Corp. said last week it has missed its originai delivery date of a highly comnies integrated loans nackage by

The vendor and last week it will not ship its letologies product until the fourth quarter of 1988 Lustomers and industry observ ers alike had been expecting a delivers date late this year or carly in 1988 for Infolosus. How Donald Steele general manager of Uccel's Financial Systems Division, said the new delivery date had 'absolutely nothing' to do with the pending acquisition of Fixed by Comput er Associates International, Inc The announcement drew a

so otreal response from industry analysts. "Any time any commo ny gives a delivery date that far out that is the equivalent of beand indufante " said Stumber Mc-Clellan, a vice-president at Mernll Lynch & Co. in New York. The problems with Infologna are substantial and that tells me that there's even more likelihood that Computer Associates will divest it. he added.

Delay creates a hassle The detay creates a problem for customers who had expected de-

invery at least by the beginning of "Whatever improvements we were planning for nur

current applications and then not going to do because of Infoloans we will now probably have to said Michael Paolantonio, a vice-president at Multibank Financial Corp., a banking holding company in Dedham, Mass. "Mo initial reaction is to stay with I'v Lei, but we will have to reassess

Because of the two-year delay - approximately 40 customers placed orders for Infolians in late 1986 - Uccel will provide temporary fixes at no charge, according to Steele. "We are at fault for the delay," he said

For those customers who have placed orders, we will be helping them with our current prod Infoloans is the long-awaited

next generation of banking systems. It was designed to comhine the commercial, consumerand mortgage-lending functions of a bank into one integrated sys-Infologies represents at least a \$500,000 investment for banking users. The initial pricing for the software alone was \$425,000. In contrast, the individual consumer-loans package starts at \$175,000, and the commercial loans package begins at \$195,000

Uccel is at least the third banking software veodor to stumble with the introduction of baoking applications. In the early 1980s. Hogan Systems, Inc. struggled to get systems out.

ADR intros PC version of its mainframe 4GL

BY CHARLES BABCUCK

PRINCETON, N.J. - A fourth generation language for person al committees with mainframestyle security and recovery features was launched last week by Angled Data Research Inc.

(ADR) as the first in a battery of products amed at type departmental users to hosts The language, Ideal Escort

mucs ADR's well-established mainfrage fourth-generation language, Ideal, and brings features to the IBM PC-DOS envi conment that were formerly reserved for host environments, said Robert T. Tasker, chef computer analyst with The Yankee Group in Boston. Ideal Escorris security fea-

tures use an active data dictionary to define users' access rights to data bases. In addition data is encrypted to provide local protection. A departmental employee could not walk up to a va cant PC running Ideal Escort and examine another user's data said Joseph A Allegra, ADR sice-president for Ideal and Ideal

In addition, "a complete "be fore' image" is maintained on data that can be used to restore the data base in case of system failure, Allegra said. Ideal Escort requires Release 3.3 of Microsoft Corp.'s MS-

DOS or IBM's Personal System/2. It is designed as a multruser system capable of running on an IBM Token-Ring or PC Net local-area network (LAN) or Novell, Inc. Netware LAN, an ADD unokesman said It is priced at \$1,000 per for the first 10 cones and \$500

per cops for each order beyond Builds end-user data base The system has its own rela al data base management system and assists in building an end-

ser data base on its main menu Ideal Escort's command lanpasge is the same as the main frame version, but applications developed with it cannot be moved up to the mainframe because of different screen paintmg and reporting facilities.

The Ideal Escort data dictio nary however can accept defanations from ADR's mainframe dictionary. Files can be transferred beween the Ideal Escort data base and ADR's mainframe DBMS Datacon/DB, but the transfer requires a third ADR product.

the \$495 PC Datacom. Tasker said he was impressed th the security, dictionary and recovery features of the product, but said ADR "hasn't achieved the level of integration" needed for a PC-based partner of the mainframe world.

change technical personnel

in an effort to port Oracle's

relational data base system

ments for IBM mainframes

network product and new

Recogning Edite
Discover Nitter
hief Copy Editer
recu Med Exits
por Chief Copy
server M Ultride
Copy Editors
V Bornier Marx ant to the Editor in C

COMPUTERWORLD Executive Edit

to Sequent's parallel processors. Oracle also is set to announce value-added reseller agreements with several with minimum or the control of the c Xerox Corp. said it olans to acknowledge the 10th an niversary of the introduction of its 3700 laser printer with enhancements for that printing system, including software to support job queuing and channel attach-Companies ocenared to release products this week at NCC also include DSC Nestar Systems, Inc., which should announce a T1 duptal

LAN products. The micrographics products division nf Canon U.S.A., Inc. reportedly will take the wraps off its Multi Format Digital Scanner System. Sensor Editor Jim Connolly contributed to this re-

IBM sticks with NCC, AT&T decides to pass which the companies will ex-

BY ALAN J RYAN

The exhibitor list for the Nation al Computer Conference (NCC), which opens today in Chicago. has been pared by AT&T and several other companies But while NCC has lost many of its exhibitors this year, mainstay IBM said it would make an announcement at the show announcement is expected tomorrow morning Among those that confirmed

last week they would skip the show are Arete Systems Corp. Charles River Data Systems. Inc., Memorex Corp., Jenn Sys tems & Software and Sequent Computer Systems, Inc. Others that have bailed out are NCR Corp., Britton Lee Inc. and Intel

uny smaller compames said IBM's presence is im portant to the success of NCC and that an IBM product announcement is a drawing card for users, some observers said IBMCs forth in this chose man bewaning An IBM spokeswoman said last week that the company nouncement tomorrow morning at the company's building in Manhattan. Late last week, an NCC

spokesman said 147 exhibitors were expected at the show and that the Chicago location is expected to prode a strong local attendee draw to the show. Area con tacts said NCC has been flooding the area with incentives and discounts to en-Of those companies ex-

hibiting at the show, few are expected to make significant product announcements. Many companies such as Fifth Generation Systems Inc. Kurzweil Computer Products. and Sorbus, Inc. said they are content to show then old product lines or products that were unveiled at Comdex/Spring '87 two weeks

ago in Atlama. Oracle Corp. and Sesent reportedly will use NCC to appointe a comaketing agreement under NCC departures
Major sendors that shelved plans to attend this war's shou



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Netview and 9370 to top IBM agenda

BY STANLEY GIBSON

Developers and industry analysts are anticipating significant 9370 connectivity and Netview

announcements from IBM to IBM is holding a product an ants and the press Tuesday in New York, some two weeks be fore the 9370's wheduled avail

ability date of July 1 The 9370 communications promised during an IBM consultants briefing this spring will be necessary to the departmental processor's success, observers

Last week. IBM foreshadmaed this week's Netview an nouncements by saying at the National Networks Conference n Washington, D.C., that Net-itew and Netitiew PC will be puripating in Systems Application Architecture (SAA). Kevin Gould as 9370 project

manager with Computer Corp of America in Cambridge, Mass... said he has received indications from IBM that the 9370 announcements will include ex-tended PU2.1 support full LU6.2 support under the compa-VM operating system and CCITT X 25 packet-switching support. Gould said that IBM also mentioned that a distributed form of Netwew could be expected in the future. I hope it's what I think it is

A lot of European customers are interested in X-25 support, Gould said 1BM executives in recent weeks have said they in-

quests for X.25 enhancements Frank Dzubeck of Communi cations Network Architects, In m Washington, D.C., said IBM personnel indicated that the company would make similar an-

nouncements, along with gradu ated pricing for Netview implementation for 9370s could be accessed under "normal VTAM. Dzubeck said.

Silverloke project Desnite widespread predictions that IBM's Silverlake project, merging the Sys tent/36 and 38 processors, will not be unveiled until later this year, at least one large Sysrem/36 user said he suspects the

announcement is uniminent The new system is cheap and faster than a System/38 and looks like a 9370 with the System/38 processor card dropped

IBM has wrapped ease-of-use fasturas around the System/38's operating system to make it as easy to use as a System/36, the

Rudolf Strobi, an industry analyst with Arthur D. Little, Inc. in Cambridge Mass, said IBM could offer a T1 switch made by Network Equipment Technol ones. That firm announced last week it had signed a remarketing agreement with IBM and that further details of the agreement will be announced short

Strobl added that IBM would innunce the intention of Net siew support under the companv's OS/2. He added that a dismid-range processors capable of actimes. Netwew nodes

A new era for VM/XA shops

BY JEAN S. BOZMAN

ng VM Extended Architec ture (VM/XA) announcements made by IBM last week begin to meet de mands for large-scale interactive processing on a wide range of previously batch-oriented mainframe», industry observers concluded late last week

IBM executives last week nutlined the scope of their commitment to VM. Daniel Colby, manager of IBM's Data Systems Products Division and Edward Altman, general manager of IBM's Data Systems Division, both stressed the potential of VM and its ability to act as a common environment for all IBM mainline machines, ac-

cording to analysts The increasing use of VM throughout the IBM line, coupled with VM/XA's ability to support four guest operating systems y neously, will allow users to do away with dedicated test and development machines, if they so MVS/XA, VM/XA, DOS/VSE and IX/370 Unix to run aide by side, and the mainframe can dynamically reallocate memory, as it is needed, as users log on to the guest systems.

ore computers to a box The benefit of being able to run MVS and VM

on the same martiage is proposally econor said Romney White, president of VM/CMS Un a Boston-haved software house limited Inthat sells VM products. "IBM is giving you a way to get more computers in one box." users may find themselves allowing a wide va ety of jobs to be supported on IBM 3090 Model 400 E or 600 E complexes instead of maintaining separate IBM 4381 machines for information center- and development-related functions. White said

key to this ability is full support of VM/CMS — something formerly available only under VM/SP — under VM/XA. "It sounds like IBM is finally going to let users take real advantage of the XA. White said, "because the power of VM is, for most users, in CMS.

He added that CMS supports many critical interactive applications, including IBM's Professional Office System, Information Builders,

Inc.'s Focus development language and graph

CMS gives IBM mainframes, at one time optunuzed for their batch abilities, an interactive

flavor that is similar to Digital Equipment Corp.'s VMS operating system, analysts said. Each user is given his own virtual machine unday VMCMS, but the former limit used to be about 1,200 virtual machines per copy of VM Now, with 31-bit addressing and the use of IBM 3090 multiprocessors, the number should rise significantly, although IBM did not specify just how many VM/CMS users it would support un-

Single-system Image week's announcements offer MIS more

configuration choices to serve their VM/CMS users, said Peter Levine, a semor analyst with the Gartner Group, Inc. in Stamford, Conn. The extension of VM/ISF from two to four processors provides users with "a loosely coupled solution, under which any user can log on to any of the connected machines and reach any application," Levine said. "With the extension of VM/ XA, users can also choose to use 31-bit VM/ CMS nn a group of tightly coupled processors and, by defunction, get a single-system image

Another fundamental change indicated in last week's IBM announcement is the ability to dynamically reportition system memory to vari ous guest operating systems under the Multiple High-Performance Option. The capability to sembles, and some observers said, surpasses, a similar mainframe feature found on Corp. machines, which is called the Multiple Do-

Over the long term, according to Steve Jos selyn, program manager for end-user services at International Data Corp. in Framingham. Mass., users may find there will be some cros other in function between MVS/XA and VM/XA But the differences between the two operating

systems remain MVS to best contact for a terms batch area. ronment, and VM is still geared toward the test, development and operating system migration "But the addition environments," Josselyn said of VM/XA SP means that IBM is building in the direction of having one operating system run

D&B sale

not believed to have performed up to financial expectations Nomad accounted for about \$20 nullion in licensing and maintenance revenue last year, observers estimated D&B Com puting's time-sharing and software maintenance husiness also brought in approximately \$20 milion in revenue, according to industry estimates

Dun & Bradstreet said it does not break out individual perfe mances of its subsidiaries and on erating units. The firm is bebeyed to have spoken to a number of software concerns garding the purchase of D&B Computing or Nomad technology, including On-Line Software International Inc Thomson, a leading Paris-

based electronics, computer and

communications ment manufacturer, has been interested in expanding its presence in the U.S software market for some time, according to industry insiders. The firm reportedly was outled last fall by On-Line Software to have Rams, from Mortin Mariet ta Data Systems, Inc. ICW,

The French firm estab lished a beachhead m the software business about seven years ago through the founding of a consulting company. United Software Systems & Services United Inc., that operates under the Located in Princeton, N.J.

U3S consults on the use of a variety of fourth-generation lanquage data hase management systems, such as Ramus, Information Builders, Inc.'s Focus.

D&B Computing Services

The Dunk Bradistreet or poration Revenue: \$40 milion to \$80 milion* Product: Nomad II fourth-generation lan guage and related Normal products, which acount for half of revenue Services: Time-sharing, software mainte

Software 1DMS/R and Nomad

* Earnard

U3S is managed by Executive Vive-President Frank Fish, a former executive at Mathematica. Inc. which developed Rames and was acquired by Martin Martin. ta Fish, who joined USS last summer reports to another Thomson software affiliate in

France called Sysca At a Glance Sources said Thomson plans to use U3S as the vehicle to acquire Nomad U3S would probably have to hire D&B Computing

personnel to continue to enhance market and our port Nomad, sources spec ulated Fish declined to comment on the report, but Sysca spokesman confirmed negotiations. Industry sources said an agreement could be announced

Nomod ottributes

The centerpiece of the Nomad product line is Nomad2, a relational fourth-generation language DBMS used primarily in IBM mainframe environments Normad2 is installed in approve mately 500 information and applications development centers and has a user base of more than

100.000.a company report says In the highly competitive fourth-generation language market. Nomed ranks third behind Focus and Ramis, according to a June 1986 report published by International Data Corp., a Framungham, Mass., market re-

D&B has another software McCormack hodan Dodge Corp. (M&D), which is beheved to have posted revenue of about \$120 multion last year. analysts said they be

heve M&D may be on the selling block, as it too is not part of Dun & Bradstreet's information ser vices strategy and has been mar smally profitable

'It does not fit at all," noted Tom Lawton, publisher of "The omputer Services Report" Belmont. Mass. "It would be sticking out like a sore thumb It's not a question of if it's going of spast a question of when

VM/XA

CONTINUED FROM PAGE 1

said Steve Josselyn, program manager for end-user services at International Data Corp. in Franaingham, Mass, "VM is now the only operating system that can be run across the entire IBM 370 line — from the IBM Personal Computer to the IBM 9370, the 4381 and the 3090."

The amounced software also has a feature that increases the number of preferred guests from one to four. However, another critical piece, native IBM Systems Network Architecture support, reportedly will not be available until firstquarter 1989; it is slated for availability with the second release of VM/XASP.

VM/XA SP topped a list of other VM announcements made late last week. IBM revamped is not vet-released liner-System Facilities software for the VM/XA SP tem Facilities software for the VM/XA SP tem Facilities software from two to four the number of processors that can share resources. The company also announced enhancements for VM/XA Sp tem Facility (SF), the current VM/XA offering that VM/XA SP is not redded to replication.

Carl Jerma, director of MIS for Turse, In 's Magainer Group in Chicago date has mouncement will not impact his option concernent will not impact his option mendal fill Miserya minositiving more and MISM keeps, minositiving more and we're going to be looking at them." Although Time's new data center in Tampa. Law will be rumming entirely under IBM's MYSKA's when it opens in the fall. Jeram doled, this will "provide us the opportunities" of the minositivity of the

In a related amounteement, IBM doubled the expanded storage capacity of its 3090 Models 400E and 600E to 2G bytes. That move was test to the VM amounteement of the Multiple High Performance Guest Support, which would allow four preferred guest operating systems to allocate the expanded storage. William L. Wilson, group director of

William L. Walson, group director of large-system management at IBM, and the enhancements to VM/XA SF indicate the verifor will not miseedistely discontinue the current VM/XA offering Bat, be added, "I wouldn't count on future enhancements to the VM/XAS Fproduct"

Buy new, pay later IBM seems to want to migrate users to

the new version of VM/XA as soon as possible. Users who purchase the operating system in 1988 do not have to begin payments until 1989. Wilson said.

Those payments will be a substantial improvement for IBM's reverue not improvement for IBM's reverue not improvement for IBM's reverue notice that the AMMA self-rend VMA offering. VMAA SF, care once time charge of \$11,220. The month is become for for VMAA SP is \$4,500. Graduated one-time charges are also available. Precise for the smaller VMAA systems in IBM's Group 30 category, such as the \$4381, are \$112,500. Feath in high-end Group 40 systems, such as the \$430. The VMAA SP is \$4,500. The such size of \$4,000. The

The extension of a graduated pricing scheme to the VM/XA products means that large-system users will pay up to 80% more for large-scale systems software under VM/XA SP Relaxies 1 and 2 this they have paid under MVS/XA, said Bob Djurdjevix, president of Annex Research, Inc. in Phoenix.

"VM/AA"s printing is going to be the lead point of the atmostancement for many end users." Durdgeve, said. "because it represents a 50% glus increase for 18M 3090 users. Initially, users will only pay about 10% more for VM/XA 5P Rebails about 10% more for VM/XA 5P Rebails. With the suppose of the VM/XA 5P Rebails. With the VM/XA 5P Rebails. With the VM/XA 5P Rebails of the VM/XA 5P Rebai

terms software. The primary benefit to the latest VMAA product is that'n can exploit the extended architecture. By doing so, the system can support a larger ammber of users white also allowing them to exceed larger application programs. Wiscovite larger application programs. Wiscovite BM-bret limitation of virtual storage.

The new architecture expands that capac-

nty to 2G bytes. The vendor would not say how manusers the new CMS will support. The current high-end production system, VM SP HPO Release 4.2, his a limitation of approximately, 1000 to 1,200 users. Peter Levine, a senior analyst at the Gartner Group, Eir, in Standford, Gonn, estimated that the new operating system could support up to three times that him.

This operating system, according to IBM's Wilson, would provide users with new limits: 258M bytes of man memory, up from 64M bytes: 2G bytes of virtual storage, instead of 16M bytes; and 128 channels, instead of 32. Access to these resources results primarily from the enhanced CMS.

In the current YMXA environment, the control program portion of the operating overen supports the extended architecture, thereby allowing it to run on the higgs systems, but the CMS portion does not. As a result, the current YMXA runs large systems, primarily to support guest operating systems. The current YMXA defenge with the The current YMXA defenge with the programment of the programmen

24-bit (Miscould not be used to run conmion applications while also supporting a large number of users, an IBM spokesman said.

IBM also said it has included a bimodal.

capability in this CMS that will allow both 24-bit and newer 31-bit applications to rununder VM:XASP.

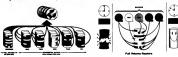
Miduest correspondent Jean S. Biszman contributed to this report.



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Comparing the systems with

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Honeywell Bull rated the DPS

8000/81 at 60 transactions per

Honeywell intros keep coming

Small mainframe follow-on, DBMS, minis spill from product bag

BY JAMES CONNOLLY

BILLERICA Mass - Hor eywell Bull. Inc. last week extended its string of product an many amounts. Issueched in the wake of a corporate morganization with software and bord ware introductions that affect four of the company's key prod-

successor to its DPS 8 small

Conn., reported that the DPS 8000 provides almost 50% bet-IBM products with similar batch ter proc/performance and reliperformance Honeywell Bull ability for DPS 8 mars He estimated that 1,200 DPS action processing as well as

8 systems are in use worldwide and that Honorwell Bull can shor about 1.300 DPS 8000-class The two models of the DPS

econd and the DPS 8000/82 at 110 transactions per second. Analyst Van Weathers, of the 8000 series are nitted against the high end of IBM's 4381 fam-San Jose, Calif.-based market reand three low-end models of search firm Dataquest. Inc., not-IBM's 3090 mainframe family ed those transaction figures potion Honeywell Bull to compete

\$1 3M (32M bytes)

with transaction processing-onented vendors such as Tandem Computers, Inc. and Stratus Computer, Inc. "That's the market that Hones well Bull says it wants to be

"Weathers said Weathers called the Di 8000 a crucial part of the Honeywell Bull product line but said the company still must add to its application software library for

No plons to cut off DPS 8

tinue the DPS 8 until customer

Although the DPS 8000 is a fol low-on to the 5-year-old DPS 8 Honeywell Bull will not discon demand abates, according to James R. Bloom, the company's executive vice-president of mar-

keting and planning operations. He said the company has re ceived 20 orders for DPS 8000 systems, which will be manufactured in the Phoenix facilities where Honeywell Bull makes the DPS 8. The systems will be

made at facilities in Emeco part The Gartner Group's Whote however, said the DPS 8000's ast reduction is causing the resid-

ual value of DPS 8 systems to plummet. "Had it been announced as an extension product rather than a follow-on, at proba bly wouldn't have had that un The DPS 8000 is the first

neywell Bull system to use 1M-bit memory clops and was designed to support 4M-bit chips when they become available Current models provide up to 256M bytes of memory, accord

ing to Honeywell Bull The DPS 8 uses transistor-totransister logic circuits, while the DPS 8000 uses proprietary array technology with 1.500 bipolar gates. Like the older system, the DPS 8000 is air cooled. The DPS 8000 is based on 10 boards, compared with 39 boards in the DPS 8.

DPS 8000/82 supports 256. The DPS 8000/81 costs \$675,000 with 16M bytes of memory, and the DPS 8000/82 costs \$1.3 million with 32M

Fahanced DPS & Plus

Honeywell Bull also added to the DPS 6 Plus family with the introduction of the DDS 6 Play Model 400 which is a compact system that can be upgraded to the vendor's existing Models 410 and

The Model 400 was designed compete with the Digital Equipment Corp. VAX 8250 and to support 38 to 50 users. Prices start at \$33,000 for a 2M-byte

Honeywell Bull announced that all three DPS 6 Plus systems now have a three-CPU option, in addition to the existing one-, two- and four-CPU capabil-

Meanwhile, company officials said the DPS 6 Plus line will be the introduction of a 600 series - and downscard later this year with the 200 series, which will be designed to compete with DEC's Microvax II. Honeywell Bull confirmed the 200 series was recently made available on a limited basis in Australia to meet The DPS 8000/81 supports the requirements of one custon 128 logical channels, and the

Interface goes two ways

oneywell Buil, Inc. last week claimed to provide manifestra twees with seamless access to both relational and nonrelational data bases through a single SQL interface with an integralrelational data base management system.

In addition to autouncing the Interel rela tional DBMS for its three GCOS 8-based ma frame tambes. Honeywell Bull introduced In foedge, which is a set of productivity tools for nontechnical users, and the Development Center Nucleus, productivity tools for data process-

Honeywell Bull claimed to be the only main frame vendor to offer the SQL-based relational and nonrelational capability, although similar products have been approunced for minicomput ers, including Hewlett-Parkard Co.'s Spectrum

The Interel SQL interface and new sets of oftware products are sumificant steps toward the ultimate goal of integrating computing resources and providing easy, consistent access to current information from any point within the etwork," said James R. Bloom, Honeywell Buil's executive vice-president of marketing

and planning one ratios However, analyst Chuck White, of Stamford, Conn.-based market research firm the Gartner Group, Inc., said Interel may not be a long-term solution for Honeywell Bull "Honeywell Bull's long-term strategy is to provide the Oracle [Corp.] data base on all of its platforms. Interelis not based on Oracle, so it should be viewed as a factical rather than strategic move-

Honeywell Bull's predecessor company Honeywell Information Systems, announced Oracle with the DPS 6 Plus municomputer (amily last year. Interel reportedly will be available in December with Sultware Release 3000 of the GCOS 8 operating system, which was an nounced in May, for use with Honeywell Bull's

DPS 8, 88, 90 and 8000 mamframes Interel regures "a few simple commands o automatically create table definition and data base table space, establish the necessary con trolling information and deposit the information

into a central dictionary known as the Information Resource Dictionary System (IRDS), acording to Honeywell Bull. The compeny said a user specifies the desired data and that Interechooses the best way to gain access

IRDS was designed to interface with full relational files, conventional sequential and indexed files and Honeywell Bull's Conference of Data System Language DBMS, known as I-D-S II, which the company has said it still supports but will not enhance according to observers

License origination (ees for Intere) range from \$8,000 to \$14,000, depending on system size. Monthly license lees range from \$950 to \$2,100. The company said the Infoedge productivity tools, designed for use by technical and nontechnical users, are supported under Interel. The basic Infoedge product set includes an electronic spreadsheet and forms generator and a menu system that integrates infeedge op-

tions, including a personal computer interface into the system The Development Center Nucleus includes tools designed to simplify the design, generation, testing and maintenance of applications. It costs \$9.450 and has a morehly beense (see of

\$3,150

JAMESCONNOLLY

Honeywell D Specifications and	neywell DPS 8000/8 systems ficultions and genealogy	
	DPS 8000/81	DPS HQ #1/8:
Memory (bytes)	16M to 128M	32M to 256M
UO throughput	17M byte/sec.	35M byte/sec.
Transactions!	60/sec.	110/sec.
Dana America	\$675,000	\$1.1M

HOSEYWED BOILCARD	NWEU DUIL CARRY			
Product family	Introduced	Price	Recent annuncements	
DPS 6/ 6 Plus	1980	\$33,000 to \$410,000	DPS 6 Plus Model 400 announced in Ju	
DPS 7/7000	1981	\$127,000 to \$1.2M	DPS 7000 untroduced in April	
DPS 8/8000	1982	\$153,000 to \$1.3M	DPS 8000 introduced in June	
DPS 88	1982	\$1.85M to \$3.7M	Enhanced in October 1986	
DPS 90	1985	\$3.55Mto \$7.6M	10% price cut in February	
			CVO	

mainframe tamily, an integrated relational data base management system and productivity tools for its GCOS 8-based main frames (see story at right) and new models of the DPS 6 Plus

The products, analysts noted. apparently had been under development but were delayed dur ing the months when Honorwall Inc., Compagnie des Machines Bull and NEC Corp. were negotiatons the cost senture that turned Honeywell Information Systems into Honeywell Bull Inc. in March, Earlier introduc tions included the replacement of the mid-range DPS 7 family with the DPS 7000 to April

These are things that were well

nema-computer

developed in the product pipeline prior to a year ago," said analyst Don Bellomy of the Framingham. Mass based market research form International Data Bellomy noted that the chall

lenge for Honeywell Bull will be to develop future generations of products - particularly software - that can distinguish the company's hardware offerings Analyst Chuck White of the Gartoer Group, loc. in Stanified The DPS 8000/81 unimmeessor and the DPS 8000182 facilities erant dual-processor are scheduled to be available in December Honeywell Bull officials said a three-CPU model and a four CPU version will be announced

in 1988 for delivery by the end of The DPS 8000 is the entry

ment. Base prices range from \$675,000 to \$1.3 million compared with base prices of \$1.85 million for the DPS 88 and \$3.55 million for the DPS 90 As with the DPS 7000, Hon-

eswell Bull is aiming the DPS 8000 at transaction processing although company officials said buyers are unlikely to be con-fused by that similarity. The DPS 8000 was designed as a corporate host in a higher perfor-mance range, and the DPS 7000 is intended for vertical markets. such as manufacturing and medi-

cal applications, particularly in office environments Honeywell Bull claimed the

DPS 8000/81 provides from 25 to five times the batch performanor and three times the trans action processing of the DPS 8/49. The DPS 8000/82 is rated at 1.8 times the performance of the DPS 8000/81

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IBM further reduces partial ownership of Intel

8Y CLINTON WILDES

ARMONK NY - IBM an nounced last week that it has further reduced its partial owner--hip in Intel Corp by selling 8.9 to the Santa Clara, Calif., serm-

The sale, which netted IBM \$361.5 million, reduced IBM's equity stake in Intel to 11 5%. Upon completion of a previously announced exchange of 7.8 m bon shares of Intel stock for IBM Eurobonds [CW, Feb. 3, 1986], however, IBM's stake would be

reduced to 5.9 million shares, or less than 5% of Intel. IBM, in its expansive spend mg days of 1983, originally purhased 12% of the chip maker, ater increasing its stake to as high as 20%. The moves prompted speculation that IBM eventually planned to acquire In-

tel. The speculation was further fueled when IBM moved from a partial equity position in Rolm Corn to a complete huyout of that Santa Clara-based private branch exchange vendor. cial slowdown and the U.S. semi conductor industry's overcanaci-

But because of its own finan-

ty, according to analysts, IBM made the surprise ann ment early last year that it may cut back its Intel stake via the hond conversion. Last week's announcement represented a further move in that direction. and IBM resterated its intention to complete the 7.8 million

"We believe IBM's investment in Intel accomplished our objective of helping to strengthen a major participant in the semiconductor industry," IBM Chairman John Akers said

Intel President and Chief Executive Officer Andrew Grove noted that the IBM investment helped Intel continue satisfactory research and development and capital spending levels during the prolonged semiconductor industry slump.

Spreadsheet compiler developed

MANCHESTER, N.H. - Soft

logic Solutions, Inc. introduced last week what it claims is the microcomputer industry's first Christened At Liberty, the

program, which allows users to develop and distribute spread sheet applications, reportedly is the first to separate the tasks of developing and using a spreadsheet. It is said to allow cornorate and third-party developers to create applications or templates using spreadsheets such as Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Multiplan and to distribute executable

I think it allows a broader range of people to make more effective use of spreadsheets in their work," said Ed Tolson, Softlogic's president, "It gives organizations and developers a way to reduce costs and to create and sell new types of prod ucts." Tolson said he believes At Liberty will appeal to corporate data processing and MIS manag ers, many of whom have cen tered their companies' spread sheet strategies around 1-2-3.

Users can run a spreadsheet compiled by At Liberty without the presence of the original spreadsheet to enter data, Tolson said. Users can then calculate results and transport that data back to the developer. All spreadsheet formulas are hidden from users, and the original file is protected from users.

At Liberty reportedly will be sold both through Softlogic's di rect-response advertising and its network of dealers for \$99.95 The program is expected to be avadable in July

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BBN enhances RS/1 data analysis package

Improved graphics, new data types provide common base for other recent intros

BY CHARLES BABLOCK

CAMBRIDGE, Mass. — A data analysis package established in scientific and engineering circles. RScI from BBN Software Priducts Corp., has been enhanced to provide better graphics and new data

Release 3.0 of RS/1 has also been redesigned to provide a common foundation for two other products introduced six months ago: RS-Discover, a package tor building experimental designs, and

RS/Explore a statistical advisory package, according to Duncan I. Mackay product manager

RS/1 includes its own English-like language. RPL which allows users to add rows and columns to a table with a single command, answering prompts for the

needed information.

Graph-making ability

Graph-making ability
The product also includes a command to
make graphs, with the user filling in necessary information and the system creatme a three-drawnsonal image.

A curve-averaging facility has been added to smooth the presentation image of an irregular curve, BBN spokesment said. Vectors and matrices have been added to RS/1 as data types, speeding execution of certain computations.

to RS/L as data types, speeding execution of certain comparations. Overall efficiency improvements have been made to speed system performance in displaying graphics, calling procedures, accessing tables and dispras outs. Efficien-

in displaying graphics, calling procedures, accessing tables and doing sorts. Efficiency has been improved by as much as 75% on the latter, BBN spokesmen said. The data handling characteristics have helped push RS/I into the manufacturing world, especially after BBN added a Qualitic Control Analysis module two years ago. RS/I is now used in an estimated 300 manufacturing sites, according to Thomas Kush, BBN vice-president.

A total of 5,000 RS/1 hoenses have been sold — 4,000 to personal computer systems and 1,000 to Digital Equipment Corp. VAX or IBM mainframe systems, Kush said

Aush said
RS/1 is priced at \$3,900 on the Microvax, \$35,000 on the VAX 780/8350 and
\$79,000 on the VAX 8800. Exprising on
the mainframe, dependent on the number
of users, ranges from \$25,000 to
\$150,000.

BBN is a subsidiary of Bolt. Beranci and Newman, Inc.

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With over a million lines of source code, Mortgage Fix is probably the largest application ever written for a LAN, says Lester Dominich, the developer of this monster program for mortgage banking back office management. We probably encountered put about every programming chalienge imaginable, but DataFixe's porreiful 4th generation programming language proved more than a match for every nituation.

language proved more than a match for every situation."

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"Mortgage Flex as very easy to maintian and, because of DataFlex's English-like structure, new programmers with minimum training fluid it easy to figure out what programmers before them have done. DataFlex macro commands also takes much of macro commands also takes much of southern off the late of the southern off the southern south

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because of its outstanding multiuser capabilities and are very pleased with the way in which DataFlex has been continually adapted to new hardware and made even better as technology has improved. Not only do DataFlex programs run on more multi-user and LAN systems shan any other DBMS product, but do so with absolutely no changes in the source code from system to system? I don't have to tell you what that means to a developer with a million and a quarter lines of programming." Take the first step to more efficient program development today for the program development today. Dust free DataFlick Demonstration. Dukettee.

BY CHARLES BABCOCK

WESTWOOD. Mass — Cullinet Soft

WESTWOOD, Mass — Cullinet Software, Inc. said last week it is offering its expert system development environment, Application Expert, for transaction processing applications in IBM's main production environment.

The \$90,000 product is geared toward providing embedded expert systems for applications running under IBM's MVS/CICS. Cullinet rewrote Application Expert in IBM's CICS Cobol after acquiring Distribution Management Systems, Inc., the originator of the product in Feb.

John Landry, former chairman of Disirrbation Management Systems and now a Cullinest wee-president, said Application Expert was developed on a Digital Equipment Corp. VAX in DEC Cobol. The rewrite adids eserval months to the period of required to bring Application Expert in on market as a Cullinet product. With the reor IBM maniferase, he said.

Customers want system

Only three copies of the product have been sold as a \$35,000 to \$60,000 VAX product, but Landry said Culinet antipates demand will be brisk. The compary's mainframe customers have been calling, "asking when the damn system will be ready," he said. Availability is scheduled for July 13.

Application Expert is an expert system shell that is and to allow a user to build a knowledge base, process the rules in it via uniference engine and go through question-and-insiver sequences with a chapier facility in makition, a knowledge-acquisition module provides an editor that helps the user add to or modify the knowledge base, according to the vendor. In its mital version, the development

In its initial version, the development shell will work with VSAM files under CICS. Before the end of the year, a version to work with the teleprocessing montor of Cullinet's data base management system, IDMS DB/DC, will be available, and the expert system shell will be integrated with Cullinet's fourth-generation language, ADS/Online, Landy said.

A personal computer version is also under development and will be available before the end of the year, Landry said.



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HP applications duel SNADS functionality a transmission waiting in a queue to be

BY ELISABETH HORWITT

PALO ALTO, Calif. - Squaring off with IBM. Hewlett-Packard Co. last week un veiled mimcomputer-based distributed application development tools that it claimed provide more functionality than Systems Network Architecture Distributed Services (SNADS)

The company also revealed inten to develop network management applications that could compete with IBM's Net-

view family HP's Netdelivery/V provides guaranteed transparent delivery of files and mes sages between applications residing on one or more HP 3000 minicomputers, according to Willem P. Roelandts, general manager for HP's Information Networks Group, "If the link is down, the software keeps trying until it gets through." Roelandts said. If a file gets through but the acknowledgement from the receiving system is lost, the receiving system will aut matically discard the duplicate file, he

Supports data delivery While SNADS is a store-and-forward document-delivery system that is most commonly used for electronic mail anolications. Netdelivery also supports delivery of data and commands between distributed applications, Roelandts said. "So you can set up a session on another computer have it find records, do a calculation and send you the results when it is finished. eliminating the need either to remain online while the job is being done or to download an entire file and do the calculations

locally." he explained In addition, while SNADS offers only three intrinsic commands - Send, Re ceive and Send Status - Netdelivery of fers 37 commands, including one that allows an application to initiate a host session on a senarate system and another that automatically changes the priority of

IBM's peer-to-peer architecture, LU6.2, is designed to handle the type of application-to-application exchange sup-ported by Netdelivery, but LU6.2 leaves it up to the user to write into each applica tion the necessary commands to initiate

each segment of the job and to ensure delivery across the network, Roelandts said IBM is reportedly working on such ca-pabilities for its Advanced Peer-to-Peer Networking architecture, which current-Iv exists un prototype form as an IBM Sys-

tem/36 networking system. The Netdelivery/V software currently sits on ton of HP's Network Services and Open Systems Interconnect-compatible Advancement networking system. In a position paper released last week, HP said that it is considering versions of the prod uct for the CCITT X.400 electronic standard, SNADS and IBM's SNA/

LU6.2. priced at \$3,800 for the HP Micro 3000 system and \$9,850 for HP 3000 Series 39

through 70 systems HP also announced that it has extended the functions of its systemwide data dictionary, which was introduced approximately a year ago, making it a "global data dictionary" that keeps track of data across multiple systems. The upgraded product reportedly allows users to merge various data dictionaries into one central used dictionary and then to distribute subsets or copies of those files across multi-

ple computer nodes. The resulting distributed system eps track of networked resources such as data bases, applications, user address es and peripherals so that applications can address resources transparently across a

The next planned release, 'networked global dictionary," will automatically distribute updates across a network so that all nodes receive versions

A second dictionary released last week is said to allow MIS managers to compile all or part of a dictionary in read-only mode, which reduces access time for applacetypes that only need to look up an entry and prevents users from making unauthorized changes to the dictionary

The global dictionary feature is available unmediately as part of the HP System Dictionary, which is included in operating software for all HP 3000

Intent to foater third po Another release from HP last week

was a position paper stating the company's intention to "provide individual network management applications, on the host or personal computer, that are common across different third-party vendors and provide capabilities like fault and performance monitoring, configuration control, accounting, security and a common data base to collect data." Roclandts said. Some of the applications provided by HP will be from third parties; some "will use our guts and their shells; some will be not HP " Roeknotts said. The user inter-

face is likely to be based on an existing product or standard, such as Xwindows or Microsoft Corp.'s Windows, he added. The company said it plans to further delineate its network management product strategy by year's end.

Optical drive boasts most space for PC

CHICAGO - Targeting users who need to economically store large files on nonvolatile media. Corel Systems Corp. announced last week what it claimed is the lughest capacity optical disk drive available for the IBM Personal Computer The firm's write-once-read-many Op

tical Disk Drive is said to have a storage capacity of 800M bytes. Corel said the disk drive supports all Microsoft Corp MS-DOS applications and does not require the use of any special commands Chief Executive Officer Michael owpland said the drive was designed for a variety of large storage applications One of the drive's key features is its audit trail canability, which enables the user to 'owckly and easily recover any file that has been updated or deleted, since all files ever written to the disk remain there owpland said. Corel said it provides recovery soft-

ware for retrieving old versions of files and for retneving file updates. An adapter and unit that fit into a fullheight disk drive enclosure lists for \$3,995. An external unit lists for \$4,395 Cartridges for the drives are \$225 each The drives are available now, Corel said

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VM Software betting on 9370

BY ROSEMARY HAMILTON

BOSTON - Banking on the predicted success of the JRM 9370, VM Software, Inc. has revamped its entire product line to suit that departmental system and will begin shipping its new VM utility software next month company executives said last

At the VM Software Annual User Conference held here last week, executives also said VM Center II. an integrated collection of utilities, will be generally available in November. A prelim mary version of VM Center II the enhanced version of VM Center, has been shipping to customers at VM Center prices, which range from \$22,000 to \$66,000 a company spokesman

son of VM Center II, currently

at beta-test sites, has not ver been established, he added The vendor also announced that two new utilities, VMspool and a rewritten version of VMbackup, will be released by year's end

Upgrades free Current customers with mainte

nance contracts on either individual utility packages or the VM Center products can upgrade to the revamped products free of charge, according to Ronald Kral. vice-president of strategic marketing. Each utility will have a different amount of new code representing these modificatione headded

customers are likely to be ulti-The utilities have been mode mately responsible for the departmental operations — and fied for easier installation and

requirement for 9370 software the firm said. As a departmental system, the 9370 is being targeted at system administrators. whose technical knowledge is

typically less than that of tradi data processing managers VM Software, which with \$18 million in revenue last year is the largest independent software supplier that markets VM tools exclusively, said that while the new products are targeted at 9370 users, they are not exclusively for that customer base. According to Kral, the vendor's traditional MIS customers have requested simplified versions of the VM Software products. In addition, many of these

the emosther those str the easter their jobs will be "With the preliferation of VM, any time savings we can give to any users will be appreci-

ated," he said.

Keeping it simple According to Kral, the modified utilities result from a project to standardize the pro-Juct line. The intent was to establish a common method of installing and maintaining the individual utili ses. Currently, the VM Softor because when you install one ware utilities are handled in a vathe next utility will be easer beriety of ways. Although the utilities are based on the same fundamental principles they were designed at different times different development groups. Kral said. The result has been subtle differences between

utilities that can make overall

anagement of utilities difficult For example, each utility has configuration file that do. scribes the system's configuration. Currently, it can reside at a different place on the system and go by whatever name the user

ssigns. With the modified versions the configuration file for each utility will use a standard name and reside on a standard place on the disk with a specific address space. Krpl said This makes installation easi

cause you know where things said Janet Gobeille, a VM Software product manager. Because the VM Center products are based on these utilities they too, will correspond to the tablished, Kral said.

Lanstar PC to shuck PBX

BY DONNA RAIMONDA In a move to strengthen its posi-

tion in the local-area network (LAN) market, private branch exchange vendor Northern Telecem. Inc. will announce this week a series of moves to redefine ate Maridian Langtor PC so a

stand-alone product.
The Lanstar PC, released in 1985, has traditionally been inlegrated with Northern Telecom's SL/1 voice and data PBX said Henry Theloosen, general manager of the Meridian Packet Transport Equipment Group, Asa stand-alone unit, the LAN is targeted at MIS or telecom munications managers who want

unshielded twisted-nair winner such as existing telephone wires, he added. As part of the strategic move

Northern Telecom signed an agreement with Banyan Systoms for that will allow North ern Telecom to resell Banyan's virtual networking software. Vines and Vines/286, and Ban yan's network servers and desk top servers with the Lanstar PC Banyan will also reportedly de

velop software modules and driv ers for the Lanstar PC network Northern Telecom has the very real perception that work groups of personal computers are a big, emerging mark said Bart Stuck vice-president of Probe Re

to implement a companywide LAN solution. Theloosen said. search, Inc. in Morristown, N.J. **Simplify DBRC** With DBAid

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NBS cooking up publishing lab

Goals to ease user confusion, form and test electronic paging standards show, held here, Rosenthal said in office systems engineering at

BY MITCH BETTS

WASHINGTON D.C. - The National Bureau of Standards announced last week that it will open an Electronic Publishing aboratory at its Gaithersburg. Md. facility next month to pro vide technical guidance to users and to help develop standards We'll provide advice to peo-

ple who are experiencing the same kind of confusion and frustration we've experienced internally " said Lynne Rosenthal, a computer scientist specializing the bureau's Institute for Computer Sciences and Technology. In addition to its role as a showcase of electromic publish ing technology, the lab will be a focal point for government and industry participation in produ ing page composition and description standards and a test

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In an interview at the 1987 Fed-

site for verifying the feasibility of the standards, Rosenthal said.

arrange of Conferences on Information Systems (Focis) trade

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the lab consists of a broad range of workstations, computers and peripherals that are used for text and graphics processing and rinting and are connected by an Ethernet network. So far, the lab is dominated by hardware and software using

Adobe Systems, Inc.'s Postscript page description language, but other product lines will be added in the future, she Adobe Systems, based in Palo Alto Cald was the only yendor

that responded to the bureau's request for assistance, Rosenthal explained. Adobe Systems will donate its Adobe Type Library and Illustrator graphics package to the lab. Computers. printers and typesetters will be donated by Apolio Computer, Inc., IBM, Apple Computer, Inc., Digital Equipment Corp. and

Feds prime target Users will be able to tour the lab

and obtain guidance about the features and limitations of the systems. The primary goal is to provide technical guidance to users in federal agencies, but the lab will be open on a limited basis to provate-sector users. Rosen-

She said applications or proects will be developed in order to evaluate the electronic publish ing systems, ranging from the execution of typical office documents and newsletters to com plex publishing tasks involving the U.S. Government Printing

The first Focis trade show consisted of five educational conferences and one vendor exposa tion

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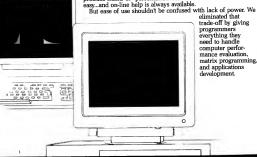
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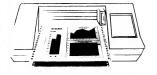
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Tenneco chooses Centrex, ISDN for data linkup

BY ELISABETH HORWITT

HOUSTON - One of the first businesses to purchase Integrat-Services Digital Network (ISDN) equipment and services on a nontrial basis, Tenneco Corp is making plans to link voice and data equipment at its adquarters offices here over -compatible Centrex ser-

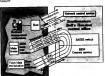
vices by early 1988. conglomerate chose ISDN not because it wants to ensure its place on technology's leading bleeding edge but because an ISDN-based Centrex existen hest meets the communications needs of Tenneco's headquarters buildings, according to John Saccente, director of corpo-

rate telecommunications The company wanted a cost effective network that would support both voice and data com munications throughout a group of buildings that house headquarters for four of its companies plus corporate headquarters. cente explains. Tenneco wants to upgrade the current Centrex service from Southwestern Bell Corp., which supports voice communications for the campus area to the regional holding hanced, ISDN-compatible Cen trex service," in Saccente's words. The new service will sup port both data and voice comm ations over the ISDN Basic

Rate Interface We chose ISDN because of the cost savings it offers and the fact that the technology would

puter Products, Inc. ISDN-com-Tenneco's ISDN Centrex lines: What

goes where? The company is still discussing details of network management services and detaining the merks of B channel to. D channel for data



We would have chosen AT&T's Information System Network if it had worked better, but we're glad it turned out to be ISDN

faces and Fuitsu America, Inc. and AT&T terminals. The com nany also has received respon from NEC Corp., Northern Te-lecom, Inc. and ICL PLC, a com-This spring, Tenneco put out a request for information to terputer company in England that sells an ISDN-compatible work menal wandows and currently as considering Haves Microcomstation. "AT&T's version of the interface is not yet fully comp ble with the ultimate CCITT standard, but AT&T plans to migrate to the rest of the specifica-

"Saccente says Tenneco specified in its request for information that terminals must be compatible with the AT&T SAESS switch that Southwestern Bell uses to support ISDN in its central office. Since different manufacturers began at different times, some have features that are not part of the current ISDN specifications We realize we'll have some mi-gration down the line," Soccente says, "The good news is that we

have choices in terms of equip-Tenneco says it hopes to choose terminals within the next few months. Implementation is scheduled for May 1988. At upgrade time. voice and data terminals will be equipped with Basic Rate Interfaces that each support two 64K but/sec. digital channels for voice, data or video and a septi rate 16K bit/sec. D channel for signaling and packet-switched

"Grinding out the Houston Southwestern Bell contract has been a unique experience," Sac-cente says, "ISDN is a different way of doing business." Instead of buying an existing service Saccente's people have had to meet repeatedly with Southwestern Bell in order to define exactly what ISDN services the regional Bell holding company will file as a special tariff with the Federal Communications Com-

Learning process Southwestern Bell also has

learned from its negotiations with Tenneco, according to Rob ert Campbell, marketing division. manager. "There have been so many more capabilities and applications to take into consider stoom we have had to sit down with them and do a study on how to use handwidth, how to access files, how much switched data will go on the B channel. It has been an educational experi-ence," he says.

One application area Tenneco and Southwestern Bell are still working out is how and where - to implement net





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work management, "We've had considerable discussion about what can be on-line. (what can be off-line," Saccente says, The current plan calls for an on-less management system that consists of a terminal at Tenneco that sends reconfigurations and other network commands to an on-premise host processor, which theo sends the requests in batch mode up to Southwestern Bell's central office.

We concentrated more on the performance aspect - what kind of action we need done in an hour, what can be done in a day - rather than mechanics," Saccente explains. At this point, Tenneco is stall unsure what kind of management services it wants beyood reconfiguration capabilities, he adds. For example, the company may want to access er-



been collected on a Southwest ern Bell system. Another guessubbands within the Basic Rate Interface — the B channel or the D channel - will be used for difcommunications needs. The B channel supports a higher transmission rate but provides less flexibility in terms of link configuration than the packet-switching D channel conection, Saccente explains

For the moment, Saccente's group, which coordinates telecommunications technology imnlementation throughout the onglomerate, does not envision ISDN as a standardized way for all of the companies to communi cate within Tenneco. Several divisions have their own network ing schemes. Tenneco Oil Co. is already using an IBM System Network Architecture (SNA) network to link headquarters with remote divisions. This link can be accomplished by having a processor act as a gateway, such as a computer on both SNA and

Remonal Bell holding company Beil Atlantic Corp. recently emposed ISDN services to Tenneco's Newport News, Va., shipbuilding concern, but the latter company had already implemented AT&T's System 85 vate branch exchange (PBX). Sacceote reports. "A premise based solution was more com patible with that company's rations needs, and besides, ISDN was not available when it (the Tenneco shipbuilding firm) was ready to implement a network," he added. However, the company plans to migrate to ISDN as AT&T migrates its PBXs, according to Sonny Marini, telecommunications supervisor for the Newport News company. The move to ISDN will be practical; AT&T is introducing a

imber of new ISDN-compatible features for its PBX. "It will be great when the whole country has ISDN and I can call Sonny up and light up his message-waiting light via my D channel." Saccente says. "But that's not why we did this." Still. ISDN is "a breath of fresh air in this confused proprietary mush-

mash we've been subjected to all our lives. Southwestern Bell currently offers ISDN Centrex as a special tariff service in which rates features and contracts are negotiatdividually with each custom-

er. This holding company does not anticipate offering the service as a general tariff in the imfuture, according to Campbell. A major reason is that and for the service is expected to build slowly. "We cannot ask our rate-payers to subsidize the service," Campbell says.

The cost of future ISDN Centrex contracts will vary with the demand in a giveo region. Local phone Co. will be able to offer both Shell and Tenneco some price breaks, because both Houston comp nues will share the same 5AESS central office switch, according to Campbell.

Jobs says Unix must mature or die But system gets positive reviews from those polled at Usenix

BY ELISABETH HORWITT

PHOENIX - With the Intel Corp. 80386 version of AT&T's Unix System V, Release 3 on the verge of shipping. Steve Jobs. former chairman of Apple Computer, Inc., last week addressed a large group of Unix programmers on how the operating systern must mature in order to successfully challenge the likes of IBM's OSI2 and Apple's Macin-

Jobs, president of Next, Inc. - a company that is expected to announce a low-cost Unix-based system this fall - spoke during a keynote address at the Usenix summer conference, held here. Usenix is a national or ganization

of Linux users. Unix will either be a mainstream operating system by 1990, Jobs said, "or [it will] die." He added that "a whole lot of money is riding on Umx not be-

ing successful. Up against Unix are powerful vendors such as IBM, Digital Equipment Corp. and Microsoft Corp., which "is looking forward to OS/2 royalties and sees 1)mx as a rearguard product," Jobs said. He also named his former company, Apple, as another Unix detractor, "When you have the best user interface, you don't want to see thousands of bright

ople trying to copy it on top of Unix — especially when Unix is multitasking

Jobs said in order to succeed as a user-oriented operating system, Unix must undergo the following breakthroughs · System administration should be simplified so that "you can open the box and plug it right

. The user interface must be improved, since the current version "is impossible for mere · Different versions of Unix must give way to one standard-

ized operating system that includes a consistent application · Unix needs built-in graphics and windowing. • The industry needs "a low-

cost, breakthrough Unix com-Jobs's speech drew moved reactions from vendors and users

at the conference I think he is talking about the mass market - users of Macintosh and so on - who don't buy systems to back," said Brian Moran, a systems programmer at The Times Micror Co. He said he might consider switching from Unix to OS/2 if the latter proved faster. "But the extended OS/2 is likely to have a lot of overhead," and programmers may not want some of

its more advanced features, be

On the exhibit floor several vendors were demonstrating products based on the 386-based Unix System V. Release 3 prod act that Interactive Systems developed in concern with AT&T and Intel

Bell Technologies announced that it will start shopping its version of the Interactive Systems product, despite the fact that AT&T certification is still an proximately two weeks off, according to Bell Technologies President Dunitri Rotov

Single-quantity pricing for Bell Technologies' offering is \$99 for two users. However support costs \$495 for two us ers, plus an hourly support charge. Installation is free. The product is said to incorporate both Interactive Systems' and Bell Technologies' device driv-

Other vendors, including Mr com/Interian Inc and Intel said they would want for AT&T certification before beginning commercial shipments of their own products, which are based on the Interactive Systems offering Micom/Interlan demonstrated its NP622, a hardware and softare product that implements Transmission Control Protocol Internet Protocol on a Unix System V. Release 3 80386 system

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ISDN networks

EDITORIAL Failing grades

"Human history becomes more and more a race between education and catastrophe."

The Outline of History

he cornerstone of the success of the U.S. in providing its citizens with the greatest opportunities in the world has been its higher education system. The products of this system got us to the moon first, contributed to a defense structure that has kept hostile forces from our soil for 175 years and, up to this point, has positioned the country to dominate the information age societies, much as we dominated the manufacturing world a generation ago.

Yet, as the opening installment of our MIS education series shows (see page 1), there are serious problems developing within that system Computerworld's comprehensive probe into the subject, aided by an exclusive survey of 700 MIS professionals, revealed that:

. The nation's best and brightest talents are being lured away from MIS career training and toward more lucrative careers in pure finance. . Fully 40% of the managers surveyed rated the

universities' ability to prepare computer science candidates for careers in MIS as fair to poor. . Interest in MIS education, as given by enrollment figures, has fallen abruptly in many areas.

leveling off at best. · Universities continue to struggle to find faculty

willing to work for a professor's salary, given the salary potential the private sector offers. Clearly, one would expect some decline in students' interest in MIS careers in line with the re-

cent (relative) slump in the computer business. But a look at the awesome needs during the next decade for qualified information professionals - a need certain to create a strong "seller's job market" - makes the current situation in MIS education look very much like a crisis

The root of the imminent labor shortage lies in the evolution of information systems management. The DP/MIS environment of the 1960s was a hardware, batch-oriented environment; in the 1970s and most of the 1980s, it was applications software, with equipment purchased and used for specific applications in an increasingly distributed environment. The next 10 years will witness the development of totally integrated. fully networked information systems. They will not be application-specific systems, per se, but flexible "enabling environments" designed to help managers initiate business plans even before opportunities are conceived. Building these systems will require the enormous brain power of professionals vested with strong technical and business skills, which is exactly what many MIS programs are failing to provide today.

The private and public sectors must aggres sively confront this crisis, as any lapse in the ability of organizations to respond to the challenges of the information age would be disastrous. The higher education system has gotten us this far. always with great public and private support. The call for help is out again, and we do not have a lot of time to react.





LETTERS TO THE EDITOR

CASE addition

I am writing in response to "Four in the front: PC market leaders" [CW. April 20]. This article on committer-sided software engineering (CASE) software listed the top four companies in respect to the number of units they have sold. Perhaps due to a slight oversight, Yourdon, Inc.'s Analyst/Designer Toolkit was not even given an honorable mention. To date. Yourdon has sold approxi-

mately 1.475 units. Yourdon's Analyst/Designer Toolkit runs on the IBM Personal Computer XT, AT and compatibles. This is a powerful CASE tool that automates structured

We certainly would have appreciated recognition in your statistics.

Lica M. DeSimone Software Administrator Yourdon Inc. New York

Making MRP sense Recent Computerworld articles

document the flap created by the Defense Contract Audit Agency (DCAA) in condemning material ments planning (MRP) systems. The press is replete with omens of gloom and doom It is time to stop mixing apples and oranges and get at the facts of this unfortunate situation The DCAA alleges that de

ing costs and defrauding the gov ernment. They say that MRP systems are causing the trouble Therefore, defense contractors would do well to go back to man-ual ledgers in order to stay out of tool Some MRP systems people say that defense contractors

fense contractors are misappli

should lobby for changes in the law so that commercial MRF software can be applied to the aerospace and defense industry. Let's try to make some sense

MRP software has been around for years. There are more vendors doing a good job in this area than CW has chosen to Continued on page 22

AT&T holding own

I am with AT&T Data Systems and proud to say so. Speaking strictly for myself, not the company. I think your editorial cartoon [CW. May 25] was inaccu and unfair. After all AT&T is investing a great deal of money and effort in trying to deliver to your readers more value than their traditional sys tems suppliers. Sure, our act is less than perfect today, but it is pretty good - better than you depicted and improving rapidly

growing competitiveness of our products, take an unbiased look at the hardware and software whiche was approximated March 24. such as the 3B2/600. Doorment Exchange and 1116.2 with PU2.1, or at our previous-ly announced Model 6500 Multifunction Communications Controller. If you can get those levels of functionality, capacity and performance anywhere



prices, we would like to know about it And there is more coming -- soon We are working on that sales

force, too, to the tune of spend ing hundreds of thousands of man-hours on technical product training and upgrading our multituer presale and post-sale technical support systems. Give us a break. It would

take any major firm years, may be decades, to make a significant impact on a relatively mature, global and hrutally competitive industry like this. Based on my 28 years with several computer manufacturers. I would say AT&T is doing pretty well for its first 31/2 years in the business

William M. Stanger Summit, N.I.

Much-pain, some-gain generation Innovation: Credit

when the AT was freshout of the

box, one of my chent's PC ex-

party configured the machine for

me, loading the various start-up

files including the word proces-

sor. He also wrote a number of

helpful macros (for example, one

keystroke took me from the

word processor to the communi-

cations program) and did some

other tweaking in the operating

system and applications soft-

Times will be hard for end users who create their own applications come to rely on. A year ago.

JOHN KIRKLEY

By 1990, 80% of applications will be generated by end users, the speaker told us ediction with eloquent extrap

olations from current trends. such as the increasing sophisti cation of foorth-generation lan guages, artificial intelligence and graphics-oriented user interfaces that take into account the way people, not maclines, like to work The speaker is highly re-

spected in the industry, has a history of making accurate predictwons and is probably right

But now, several weeks later. I sense that she left something and I do not doubt the predicted trend toward end-user applicatrons generation will happen. But I do wonder just how painless it will be. If my experiences are anything like what a fledgling end user might go through. I would recommend root canal work as a fun alternative.

Although my experience takes place outside the corporate setting, there are parallels as to what end users may find.

My IBM Personal Computer

The file garage It all began simply enough

AT was going away, and in its place I decided to purchase a Personal System/2 Model 30. The hulking AT, with its 30M-byte hard disk, had monop ohzed a good part of my office for a year, on loan from a chent. It accumulated a rich compost of files and programs, including all the little bits and pieces that one slips into a 30M-byte computer's seemingly infinite memory and

then forgets to clean out.

I had fallen prey to those foes of wood disk housekeeping, those voices that say, "... probably need this some day" and "I'll get around to cleaning out those old files next week." And so, like wind-blown paper, files that should have been used once and erased, began building up in sel doni-visited subdirectories

You know what happens Pretty soon your disk begins to emble your garage, contain ing bits of old lawn mowers, odd ips of wood and wire, rusting and bent yarden implements three-quarters of a bike, a hose with random holes, lawn chairs as down need of remulations and some parts for the 1964 VW you and eacht years ago.

mazazine, is an industry consultant our He is based it South Syack, N.Y.

To addition to all this junk. back in its original box, ship it to there was a powerful, flexible the client, turn on the Model 30 word processor on the AT I had and keep on trucking

That was many days ago Since then I have come to know the mays at the computer store very well. I spend a lot of time there. One of their techies and I sit side by side, staring at screens, trying to figure what went wrong this time As I write this column, the yboard is functioning errati cally. I have lost all my lovely macros, my communications program has taken a yew of si-



ware to make my life easier

But now it was time to switch to the Model 30. I felt a touch of panic - all those files, all those lovely macros, that nafty word processor. I didn't want to start from scratch; in fact, there were eral jobs in progress on the AT. What I needed to do was make a smooth, painless transistion from one marking to the

other without missing a beat. I set aside a morning to do the sob I called the computer store at which I decided to purchase the Model 30. "No problem," they told me. "Bring the AT to the store: we'll hook a cable between the two systems and simpl pump the AT dry. Slap the AT

ience, and my spelling checker has undergone some strange metamorphosis. When invoked it threatens to eat anything that comes near it

Most of the people at the store are very helpful. Their level of familiarity with the system varies, however, so I often have to wait until the person who knows how to solve the problem of the moment is free. Sometimes this person turns out to be an individual who has that remote, cryptic personality many have accused DP managers of developing This individual wants to communicate only with

machines; people are a Continued on page 22

only where it's due

EFREM MALLACH ave technology

True or false? True. IBM is one of a few cor porations in the world with genu-

ne basic research capabilities They have made major advances m many fields. Their superconductor work is renowned The firm is a leader in thin-film mass storage technology and highdensity semiconductor memory every advance in half-inch magocuc tape recording. Optimizing compilers are indebted to IBM's

IBM is not bashful about these accomplishments company recently ran full-page ads showing the chemical formula of a new superconductive maternal and explaining its significance Ask IBM about its technology and you will get a long list of nifestones plus an armful of literature. It has

make screens Unfortunately, the hoopla ob-

scures one vital fact about IBM technology, a fact users must understand for their own protection. Since the 1950s, IBM technology has been devoted to producing incremental improvements in the way things are already being done

IBM's large mass-storage dences feature higher capacity. better performance and lower cost (not necessarily lower price) per megabyte than any hads else's Every new product is followed by two years of competitive catch-up. But are larger. faster, less expensive disk drives a conceptual change in the way we use information? It's the same for tapes, semiconductor memories, optimizing compilers microprogramming

Now let's look at some things that have changed or may Word processing? Wang Labprotones. Inc. pushed it fitst

Several years later, IBM came up with the Displaywriter Integrated office systems? From sev eral minkomputer vendors. Networking? IBM's Systems Network Architecture was a weak reaction to what had been come on in Europe for years Unne? IBM is being dragged

Matter & Levy Box of Reputation College School of Management and to a comant to top user and sendor executions Much of his consulting work mericesystems selection and competitive and

Virtual memory? A British development that General Electric Co. and MIT proved practical be fore IBM 'invented" it Data base management! From GE

Multiprovessor proinfrances? Almost every other vendor had one before 3080s came along Once in a while of cour-IRM does bit on something It did pioneering work that led to relational data base managemore and tenta. But the more was carried out as nure theory and IBM didn't realize what it had When it came to real productonly a OBMS market share here orrhage got DB2 past the "tostage IBM is still years behind Oracle Corp. and a host of others

BM technology has been devoted to producing incremental improvements in the way things are already being done.

Look at personal comput-

IBM revolutionized the way data

is processed on corporate desks

in this department

They took an unstructured world of 16-bit nucros desperate for standards and gave it a flag to rally around. The PC was not a triumph of IBM technology however The Pt. technology was from Intel Corn. Macrosoft Corp. and a host of other suppli ary IRAC - strong was a tri umoh of planning of marketing and of one man's vision helper by being in the right place with the right ingredients at the right time. But IBM technology? Not in the Pi

The Personal System/2 is dil ferent Instead of being 15% "native IBM." the fraction is closer to 80%. But the PS/2 technology is devoted to doing the same things the PC does and only sightly better. Graphicadanters are smaller better and a tad harder to clone. There are fewer chips, hence higher reliability The hus is faster.

But innovations in the way things work? Wait for the new operating system from Microsoft. If you want desktop action. check Apple Computer Inc. latest quarterly results. The Macmtosh is genuinely different It's doing in the PC market what Digital Equipment Corp hadone to the mel-rance. Much of what's new in PS/2 is there to make it more. Mac-like

Generation

their own applications

ng annovance. True, he knows his stuff, But imagine him running an information center or being the key contact at an end-user help desk

So, this simple conversion, my mantrauma, causes me to wonder about the ter as they become more enmeshed in domg their own computing and developing

The transition would probably be easy if each new user came to the game unstill hed by past experience, free of any bag-

gage, a tabula rasa; if users came without old files, without work in progress, without little programs, routines, bad habits odd quarks and forbles; if they came without that garage full of stuff that has been accumulating for years. The problem is they don't. And the MIS department

members assigned to support these end users will be sorely taxed Perhaps now is the time for MIS to see that some nonstandard courses are added to the continuing education requirements for their end-user support staff courses in interpersonal relationships; the art of communicating ideas, facts and

concepts while being sensitive to the other person's needs; how to listen It could make the transitional years to 1990 a lot easier for everyone.

Innovation

CONTINUED FROM PAGE 21 There's a reason for IBM's technology

cal conservatism. When you dominate an industry, you want to keep things the way they are. It's simple economic common sense. As long as users keep doing things the same way, they will tend to stay with the incumbent vendors. If users think about doing things differently, they might shop around. It is in IBM's economic self interest to perpetuate present methods and to improve them just fast enough to hold on to most customers. An IBM executive who suggests any other policy ought to be fired

Don't get me wrong. IBM is a fine com-

pany, and I have recommended their products many times. Most users don't need innovative technology "Pioneers are the ones with the arrows in their backs," as the saving ones. Users want results. And there is nothing bad about

doing things faster and cheaper, as long as the things one is doing are really the right things to do. Sometimes, however, the best answe to an information processing need doesn't

me from doing the same old things a little bit better, a little bit faster and a little less expensively. Sometimes, the big pay off comes from doing things differently. If that big payoff calls for systems that deal with information in new and innovative ways, the technology isn't likely to come from IDM

Making sense CONTINUED FROM PAGE 20

name. MRP, either in commercial or aerospace and defense applications, is a planning system. The execution of work orders and ourchase orders planned by an MRP systems contract has all the necessary logic to maintain the integrity of every contract and related cost throughout its life

The real problem lies in aerospace and defense contractors trying to apply com mercial or specific MRP software without understanding the disciplines needed to make the software system auditable and acceptable to the DCAA and other government agencies. The problem has been compounded by some in the DCAA who have taken a Neanderthal view that is destuned to throw out the child with the bath water. Going back to manual ledgers can only make the data more maccurate and substantially increase the cost of providing effective weaponry to our government sed as albes The bottom line is that MRP systems

contracts, properly implemented and understood by knowledgeable aerospace and defense contractors, has and will continue to contribute to managing the costper-schedule performance in the complex natrix of contracts in which defense contractors must operate. Donald N. Frank

Principal Ployd and Frank Florkam Park, N.I.

Indy report lacking

Now come on. Combutersorld. You can do better than the coverage on the Indianapolis 500 race - the world's biggest single-day sports event [CW, May 25]. There are personal computers runnin.

rampant in the nit areas, but you failed to mention the fact that Packaged Automated Life/Liability Management, Inc. mon tors the race - car by car, all 33 and for the entire 500 miles, and the race is not officially over until they say so How about the winner? This year, it is

Al Unser Sr., the second four-time winner in Indy history (Bobby Rahal was last So let's get the facts straight next

time. But we still know one thing is true computers are still faster than those Indy cars. Constance F. Mays

Vice-President VM Systems Group Arlington, Va



said the only thing that remains con stant is change. No sooner is a pron completed than changes get made And so many get made so often that staving in control of it all can be more than humanly possible

That's why thousands of company like the BASF Corporation, Giant Food erce Union Bank let ADR/The LIBRARIAN* do it for them Commerce Union's programmers every change, available instantly. And While The LIBRARIAN's Chang Control Facility helps make sure every

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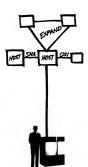
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SOFTWARE & SERVICES



Cobol review inconclusive

A public review process is under way to collect comment on the proposed addition of intrinsic functions to Cohol 85. The m. trinsic functions would add several low-key mathematical capabilities to Cobol, but some narries question whether the process of adding them - the addenda process - doesn't di lute one of the chief virtues of Cobol, its stability as a business

On the one hand, the advo cates of Cobol want to see at en riched with added capability They want to see it adapt to modern times and continue to grow as a viable language. The terms they use and the posttions they take are so closely at hed with the whole frame of mend of the computer industry that at first glance it seems impossible to argue with them.

We want Cobol to be a rich and successful language . . We're keen to see it continuing to improve," says John Triance. the noted English Cobol authorsty and product development manager for Micro Focus Inc., an advocate of the addendum process

We feel the addendum process is a good way to change the standard without waiting for a wholesale revision," says Bruce Sinclair of Cobol compiler make

Volume applications generated

Programmers use system along with own Cobol, PL/1 know-how

BY ALAN ALPER

FORT LEE, N.J. - On-Line Software International, Inc. recently unveiled an application generator for volume transac tion processing systems residing on IBM mainframes and compa

Called Intelagen, the application generator consists of a fourth-generation language and a menuadrayen front end that is said to enable programmers to generate annications written in standard Cobol or PL/1. The application generator operates in a

variety of on-line environments. including CICS, IMS/DC or IDMS/DC, or as a batch program under an OS or DOS/VSE environment, On-Line said. On-Line is not positioning In

telagen as a "be-all and end-all" for an application's life cycle, but as a flexible source-code generator that builds on a program-

mer's expertise, noted Irwin Kanopolsky, On-Line's assistant vice-president Approximately three-quarters of all application development tasks, including documentation creation, an performed by Intelagen, he said

Intelagen was designed to work with a programming staff's existing development method ology rather than empose a new discipline. "People do not want to have their expertise taken away. So we're selling them a productivity tool which still uses their Cobol or CICS expertise. Kanopolsky said.

Intelagen enables programmers to cut application generation time in half, he said. Programmers primarily use English-like 4GL commands. About 10 lines of Cobol code are created for each line of the 4GL code. Kanopolsky noted, "A standard CICS undate transaction can be done

Intelagen also allows programmers to combine Cobol code with 4GL level command which enables programmers to learn how to use the tool at their own pace, he added. Another familianty for pro-

grammers is Intelagen's nn-line adstor, which w similar in form and function to IBM's ISPE Kanonolsky said. The on-line editor also warns programmers of syntax errors, he added Help screens can be displayed

by depressing function keys. A built in data dictionary enables users to store a field definition in a central location and a screen and report generator allow intelagen to work closely with end users to develop screens. Kannpolsky saud

Maintenance is decreased when generating applications using Intelagen because structured code is written. Kanonolsky said. Continued on page 29 Uccel fuses

acquired line

BY JEAN'S BOZMAN

DALLAS - Uccel recently said

it has integrated the products of California Software. Inc., a con-

pany Uccel acquired in Decem

data base that tracks hardware

and software configurations in a

data center, has been interfaced

to four Uccel products. Netman

now works with the UCC-1 tape

management system, the UCC-

work load scheduler, the UCC Continued on page 34

Uccel's Netman product, a

ber 1986, into its own line

Monitor rewritten for VSE/SP

BY ROSEMARY HAMILTON PRINCETON, N.I. - Applied Data Research, Inc. (ADR) re-

cently began shipping a revamped version of its performance monitor system that is designed for the IBM VSE/SP operating system ADR/Look Release 3.0 has a

ne-time license fee of \$12,600 The vendor also offers an IBM MVS version with a \$35,000 is

The previous version of ADR: Look was designed for the older VSE operating system Release 3.0 can also be used with the non-SP versions of VSE, but it includes a number of facilities that can only be exploited in the newer VSE-SP environment. the vendor said

One such facility is Task State Analysis, a component of Release 3.0 that is said to allow users to view on line the status of a given task at regular intervals It tells you where a job is spending time, and that helps you identify the bottlenecks in the system," said David Korz, an ADR/Look development manag-

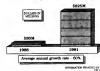
The vendor claimed that be Continued on page 34

Inside · DEC enhances corporate

videotex with All-In-1 integration. Page 27 · Focus expands into corporate operations. Page 33. Bibles adds PC ention to mainframe application devel opment. Page 34

Data View

European market for artificial intelligence products to grow tenfold France, Italy. UK and West Germany spent \$80 million on Al soft-ware in 1986 and will spend an estimated \$825 million by 1991





Continued on page 27

REPORT ON DB9



The Only Comparison More Important Than His Is Yours.

Here's your chance to find out why Dr. Edgar F. Codd, the originator of the relational model, found SUPRA ** from Cincom* superior to IBM's DB2.

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Sharon B. Weinberg, President of Codd & Date Consulting Group and a former relational database consultant with IBM* responsible for releases of DB2, will review Dr. Codd's point-by-point comNow In Your Area: A Comparative Seminar Of SUPRA And DB2.



parison of SUPRA Release 1.3 and Release 2 of DB2. She'll demonstrate why Dr. Codd concluded that SUPRA adheres to 10 of his 12 basic rules for the relational model, versus DB28 7 of 12, and explain why he stated, "SUPRA's rating is the highest achieved of all those I have

reviewed to date."
Advance registration is requested for the half-day seminars. To register or get more information, call Cincom today. Or, write Marketing Services Department, CincomWorld Headquarters, 2300 Montana Avenue, Cincinnati, Ohio 45211.

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#CINCOM

Autenceusystems And Applications software for tish and v.c.

DEC videotex upgrade integrates All-In-1

BY NINAMARY BUBA MAGINNIS

MERRIMACK, N.H. - Digital Equip ment Corp. is now shipping Version 3.0 of its enhanced VAX VTX software, which can be integrated with the highest version of All-In-1. DEC's office automation sys

VAX VTX allows the communication of business informaton to large numbers of users throughout an organization. DEC said. Users can opt for VAX VTX when information dovernmating prisewide and electronic mail for personto-person links, the vendor said.

VAX VTX also integrates with DEC's WPS-Plus word processing software for soft-copy document distribution using the VAX Integrated Publishing Systems.

Version 3.0 additions Enhancements include VTX Infobase Structure Tool and Assister (Vista), a videotex application design tool and facilities for direct access to any VTX informa tion base from IBM 3270-type terminals linked to an IBM host, according to DEC Vista reportedly enables nontechnical users to design and organize VTX information bases. After the information base is organized, users can create documents using WPS-Plus and transfer them to the VAX VTX information base by specifying that the document is destined for VTX instead of a printer, DEC said

The VAX VTX Applications Link Utili ties connect VTX users to other applications and to critical corporate information such as operating reports, sales figures, budgets and financial data contained in existing data processing systems, the vendor said

IBM 3270 terminal users connected to an IBM host can interact directly with a VAX VTX information base via Decnet and DEC's Systems Network Architecture gateway

The enhanced software can store and dehver full-screen graphics for VMSinformation delivery vehicle for technical applications in engineering and manufac

VAX VTX support of international ter minals includes the Minitel terminal for access to the French national videotex system and DEC's new VTX20 videotex terminal, which DEC said is a VT220 compatible terminal for supporting all Eu

ropean presentation display protocols VAX VTX Version 3.0 is priced from \$2,630 on the Vaxstation 2000 to \$83,130 on the VAX 8978 All-In-1 Ver sion 2.2 is listed from \$3.375 on the Vax station 2000 to \$106,880 on the VAX

8978

Cobol review

er Ryan-McFarland Corp

Jerome Garfunkle, the Litchfield, Conn., Cobol authority and originator of the process, says he wishes the current addendum would go further and add other features to Cobol, such as a Boolean bit facility or a VALIDATE command for validating data. "That's how fourth-generation languages work," he notes. The advocates of the addendum pro-

cess make the argument that it took 11 years to get from Cobol 74 to Cobol 85: the existing process is too slow to keep Cobol a contemporary language On the other side are the Cobol users, who have a huge inventory of source code and a shrinking staff of programmers to maintain it. "I think there is still a major

question of whether the addendum process isn't a backdoor way of postponing the issue of the next major revision, says Lawrence Madison, director of data processing at Travelers Insurance Co. Added features mean some program mers will delight in adopting them while others will ignore them, causing "the

maintenance programmer to spend an inordinate amount of time" figuring out what some other programmer has been doing, Madison says Because of this division of opinion,

the X3J4 Committee of ANSI has pro posed an innocuous change as its first test of the addendum process. Intrinsic ctions, which include a limited num ber of trigonometric functions and statistical calculations, have been advanced and more complex additions have been deleted because the committee wants the first round "to be a victory for the ad dendum process," Garfunkle savs.

As such, this stage of the addenprocess won't tell us very much. If intrinsic functions fail to raise public complaints, they will probably be adopted and become part of the Cobol 85 standard. But a more complex proposal that the business world feels is superfluous to daily operations might invoke a storm of st reminiscent of the reception giv-

en the first version of Cobol 85. Thus, the current trial-balloon adden da 15 not going to tell us anything. It is intentionally innocuous, and real change when it comes via the addendum process. will once again tempt the DP community

to resist rather than embrace change in which it sees little benefit. Bahrock is Constituternania's serior editor, soft IUNE 15, 1987

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The RDBMS for people who know better.

Data View

Computer Associates' shopping spree The company has acquired 15 software last five wars



Applications FROM PAGE 25

mers can create documentation, such as a systems flow, screen and report images, file layouts and data cross-reference between Cobol and 4GL code, Kanopolsky noted. Intelagen interfaces to IBM's IMS and Cullinet Software, Inc.'s IDMS, Support for IBM's DB2 and SQL will be offered in the first quarter next

year, Kanopolsky said. Currently available. Intelagen carries a permanent licensing fee of \$80,000 per processor and \$120,000 per data center. Kanopolsky said the firm's pricing scheme is intended to sway fence sitters who have evaluated appli cation generators but have not yet taken the plunge. "They've looked at other products but

found that the price was too prohibitive," he said. On-Line acquired Intelagen last year from a small West Coast development firm that Kanopolsky declined to identify. Kanopolsky said users of On-Line's UFO Productivity System

who want to generate source code using Intelagen may be able to do so. "If they want to, we may have a way for them to do

The UFO Productivity System, he added, is for users who want to get a production version of an application quickly as well

OR THOSE people who need the security blanket of having source code, Intelagen provides it."

IRWIN KANOPOLSKY ON-LINE SOFTWARE INTERNATIONAL INC.

as for those who like a dynamic data dictionary. "For those people who need the security blanket of having source code. Intelagen provides it," he said. Other application generators that produce Cobol source code include such products as Sage Soft ware's APS and CGI Systems

'Cradle-to-grave' approach to CASE

BY CHARLES BABCOCK

CAMBRIDGE, Mass. - A 32bit workstation running Unix with a large screen for displaying windows makes the best plat form for developing software and in the future is likely to become "a generic item, a com-modity," a software development expert predicted recently. Tony Wasserman, professor of medical information sciences at the University of California at San Francisco and president of

software development tool firm Interactive Development Environments, Inc., described the characteristics of the workstation at the First International Workshop on Computer-Auded

Software Engineering (CASE) here recently Such a workstation would be

likely to use a Motorola, Inc. 68020 or other member of the Motorola 68000 microprocesso family. It would run Unix for its ability to host tools that commu rocate with one another, and it would need a large display to al-"because low multiple windows software developers like to do two, three or four things at once." Wasserman said. Such a workstation should

also support Ethernet and Transmission Control Protocol/ Internet Protocol communication protocols, he said. Several workstations match-

ing this description are available. he noted

Even more important, how ver, would be the ability of the software developer to utilize some underlying development architecture that allows the tools used at one stage of develop ment to pass on files and specifi-

ations to the next stage. "It's clear that the life cycle coverage is incomplete. There are large areas where tools just simply aren't there yet." he said Testing is an area where tools are inadequate; where they do event they offer inconsistent user interfaces or fail to integrate in other fundamental ar-

eas, Wasserman said. Where I want to point us is toward the notion of a collection of tools that support cradie-to-grave approaches, "he added



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Focus pressed into production applications

BY CHARLES BABCOCK

PALM DESERT, Calif. - Information Builders, Inc.'s Focus, long known for its end-user data retrieval and massaging, is being pushed beyond its information cen-

ter roots into daily corporate operations. Just how far it has progressed into production systems was evident in talking to members of Focus Users for System Enhancements (FUSE), the independent users group that held its 10th annual meeting here recently

One example was Lone Star Steel Co. in Lone Star, Texas. The maker of tubular goods for the oil industry faced drasts cutbacks as oil prices fell and oil drilling all but died in the Southwest's oil patch. As production and payroll were cut 75%. Lone Star's management sought ways to adapt that would permit the company to

Can-da attitude

In October 1986, Lone Star's chief executive officer ordered a new company bene fit plan put in place within three months. Steve Hill, director of the information center at the time, recalled: "When the vice-president of MIS started discussing who could put the system together, only the information center thought it could."

The core of the information center staff, which had been teaching Focus to end users, became a development team that produced the cafeteria-style plan within its deadline. The new benefit system helped free up \$90 million in the company pension fund, which had been overfunded with the job cutbacks. The legal availability of that money became a key to the commany's varyival as it represented into a mainstream steel producer, company spokesmen said

By the end of the benefit project, the corporate MIS staff had been trimmed from 80 to 15: the information center was phased out, and many of its staff members were sent looking for new jobs. But Hill was deemed too vital to be let go and became the director of support for new husource systems

Reflecting on his information center training, he said, "Part of my job is training human resource people to not need me. They do their own reporting, applications and maintenance. Lou Lovell, manager of salary adminis-

tration and personnel records at Lone Star Steel, said the switch to a Focus system has reduced the amount of time speni waiting for reports. "Ten percent of the work is maintenance, and 90% is reporting. If you can put that 90% in the hands of the end user, you have saved yourself a lot of time "she added

Another mainstream corporate user of Focus is Jack Schlosser of Smith Cline Beckman Corp., a Philadelphia pharmaceutical company. Schlosser directs a side-effect reporting operation that analyses data from worldwide users of Smith Cline products.

Sale-effect reporting used to be a host machine operation, using Focus on an IBM mainframe, but Schlosser suggested that a \$100,000 annual chargeback could be trimmed to a three-year, \$35,000 expense if the system was downloaded to PC ocus on four workstations, a file server and a communications machine on a Novell Inc local-area network

data bases via mannframe Focus. Schlosser's group can collect and analyze the data required for Food and Drug Ad ministration reports and Smith Cline's

There are drawbacks, Schlosser said The side-effect group must do its own backup a duly 20-marute operation. The group does not have an audit trail if the system fails prior to backup, "Fortunately, we haven't run into that circum-

ice." he noted The communications machine an IBM Personal Computer AT with a 640K-byte memory limitation. "kind of chokes" on a

files as it parcels out copies to workstation users Schlosser and Nevertheless, he added, his group has

scored a bit with upper management. The cost savings came at an excellent Another user, James Bowler, a project

manager for Nynex Corp. in White Plains. said his 15-member team will develop a Focus system to measure the performance of switch-repair personnel It will replace a system formerly devel-

oped by AT&T in its proprietary language, OTSS, which Nynex no longer wants to use. "If we use it, we have to maintain it." he said. Maintaining a systent in Focus will be easier than in OTSS. and the future development of the language will be in the hands of a vendor rather than Nynex he noted

Sara Zuk, the outgoing president of FITSE said the grown has been an umportant source of pressure on Information Builders to "put Focus into more main stream production environments

Zuk, the information center manager for Norwest Corp., a bank holding compa ny in Muineapolis, said Focus is finding ore production uses in her comand FUSE's lobbying for a COMBINE uand, PC-to-mainframe connectivity and greater performance efficiency has given Focus more nf a ' production program capability "

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Page		

Monitor

CONTINUED FROM PAGE 25

the VSE/SP operating system, it will have overall performance improvement over Release 2.3A

No longer in supervisor portition ADR/Look no longer resides in the super-visor partition of the VSE operating system, as did Release 2.3A, according to Joseph Murphy, an ADR/Look product

Instead, users can install it in either a user-defined partition or in the power partition, which is a job scheduler.

As a part of the supervisor partition which is considered the core of the operating system, APR/Look was competing with several other tasks for the supervisor's time. Murphy said of the older ver-

Can function independently Now, it functions as a subtask of the pow-

er partition or as an independent parti-

What this does is free us up to create some real nice facilities, like graphics support, that the customers have been asking Murphy said in reference to future product enhancements

Before, we would have been putting oo much overhead on the supervisor. Our ability to add to the product was limit ed "he said

Uccel

CONTINUED FROM PAGE 25

11 rerun manager and the UCC-9 hardware reliability monitor. The interfaces were written after the acquisition by Califorms Software's programming stall which still is located north of Santa Monoca. Calif. Netman developer David Tootili, now

a vice-president of research and development at Uccel, said he anticipates that the Netman product and its gateways to Uccel products will continue to be marketed after Uccel's merger with Computer Associates International, Inc., announced two weeks ago, is complete

I expect there will be no change at all." he said last week, "because Computer Associates has no similar products in Developed in 1980 by Tootill and oth-

ers. Netman handles several aspects of running a data center. It monitors the hardware inventory, displaying system status on a screen: tracks the leasing and other financial arrangements made to acquire the hardware, and handles change and problem management. Netman's data base also lists all software applications and on which machines they are being

Another new feature of Netman is a entages to IRAL's Naturals Problem Determination Application, which automatically logs hardware problems into Netman's problem management application. Liccel spokesmen said.

Netman can be run in the following IBM environments: MVS/TSO, MVS/ CICS, VS1/TSO, VM/CMS and PC-DOS VSE/CICS. Netman is currently priced at \$45,500 for the MVS and VM/CMS environments. The price is scheduled to be raised to \$49.600 by June 26, Uccel said

Biblos adds micro option

BY ROSEMARY HAMILTON

NEW YORK - Biblios Technology, Inc. recently added a personal computer option to its application development soft ware while also enhancing the basic pack-

Biblios Release 2.0 is currently available and runs under IBM's MVS operating system. Licenses for Release 2.0 start

at \$75,000, the company said. The PC option, which costs \$2,000 per acrocomputer to license, allows users to

develop and test applications on the PC and then port them to the mainframe for

The mainframe portion of Biblos has here enhanced to automatically recomrule code from the microcomputer, the

Cuts development-time costs This should cut costs on mainframe de velonment time," said lanet Baldwin marketing manager at Biblios. "In the PC

mode, we emulate CICS. You can do ali our testing there and then bring it over to the mainfrance The vendor does not provide a main frame-to-microcomputer tions facility, allowing customers to make

use of Irma boards or whatever link they have in place. Baldwin said.

The new release also includes a proto typing component that can be used for modeling on-line portions of applications

and a Help facility. Biblos, first introduced in 1983, was designed for Cobol and CICS environ-

The basic package includes support for the IBM VSAM file system, according to Ari Sternberg, president of Biblos. Optional support for IBM's IMS, Cul linet Software, Inc's IDMS data base management system and Software AG of North America, Inc.'s Adabas is available from Biblos. Support of one additional data have costs \$15,000, while support of two costs \$20,000, Biblos said.



N E R 0 D - 11 c

Systems software

Mercury, a preconfigured, real-time, integrated fault-tolerant international banking system, has been introduced by Internet Systems Corn

Designed to run on Tandem Computers. Inc.'s CLX and EXT systems. Mercury provides a set of software modules for processing major types of banking activities. Application modules include foreign exchange and money markets, commercial lending, limits management, current accounts, dealer information and electronic funds transfer.

The Mercury system includes prode

fined processing rules, standard reports and formats, screen layouts, message and error handling and security. Customization is available

Mercury costs \$250,000. A renewable hoense costs \$25,000 per quarter Internet Systems, 17th Floor, 200 W Madison St., Chicago, Ill. 60606

Applications packages

ne CAE Systems, Inc. division of Tektronix, Inc. has enhanced its Merlyn-S standard cell layout system, physical design system for standard cell d block layout

The software is said to offer fully automatic placement and routing as well as in teractive editing tools. Features of Merlyn-S include capabilities for data base creation, graphical floor-planning and

routing Specific enhancements include inter active floor-planning controls, automatic power and ground tapering and channel compaction and routing of designs with

any number of macro blocks located anywhere in the layout. from their terminals without any operator The new version of Merlyn-S is priced

om \$50,000. It is said to run on Digital Equipment Corp.'s VAX and Apollo Computer, Inc. and IBM systems

CAE Systems, 5302 Betsy Ross Drive. Santa Clara, Calif. 95054.

Utilities

Goal Systems International, Inc. has released FAQS/MVS, an on-line rob-status monitor for IBM and compatible main-

FAQS/MVS is said to provide MVS/SP and XA users with commands for deter mining the status of the systems or jobs within the systems. It allows program mers to control the execution of their jobs

Commands include Activity, for displaying the status of jobs executing. Console, for listing the contents of any active MVS console: and Display, for showing the contents of virtual storage for any sub-

FAQS/MVS costs \$7,420 Goal Systems, 5455 N. High St. Co-

lumbus, Ohio 43214

Keyword Office Technologies Ltd. has introduced a Digital Equipment Corp. VAX-based user interface software program called Keypak Plus I Keypak Phis 1 is said to allow integra-

tion of Keyword's Keypak Editable Document Exchange (EDE) services with DEC's All-In-1 office automation system Keypak EDE is a VAX/VMS layered product that is said to allow a VAX user to exchange documents with other VAX us-

Keypak Plus 1 is an extension of the crandard All-In-1 reterface and eses All In-1 electronic messaging for document distribution. It costs from \$2,000 per copy for a Microvax II to \$6,000 per copy for a VAX 8800

Keyword Office Technologies, 2816 11th St. N.E., Calgary, Alberta, Canada T2E 757



ment security system said to provide automated application-access control in Oracle Corp.'s Oracle data base management system environments, has been announced by D&N Systems

DBA Companion is said to perform Grant/Revoke SQL statements as users are inserted and deleted from application specific user classes. It consists of a set of nine screens for assigning resources, ta bles, privileges and user classes for each application

DBA Companion is priced from \$395 to \$28,800 D&N Systems, 153 Watson Road, Bel

mont. Mass. 02178 Development tools

Biblos Technology, Inc. has an-nounced Biblos Release 2.0 a systems generator designed for IBM mainframes in Cobol/CICS environments with USM IDMS. Adabas and DL/1 data bases

Release 2.0 includes a personal com puter option said to permit full systems development on PCs. Other features in clude a screen-oriented technique for analysis design and decomposition of systems, the ability to model the on-line portion of the application, a Help facility, an interactive debugger and a file-maintenance facility Biblios Release 2.0 is priced from

\$75,000 to \$100,000 Biblios Technology, No. 1220, 2 Penn Plaza, New York, N.Y. 10121



The improvements



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While many manufacturers cripple high-speed processors with low-speed RAM, Compaq gives you up to 2.1 Megabytes of 12-MHz RAM on the system board without using an expansion slot, 8.1 Megabytes using only three.

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are out of sight



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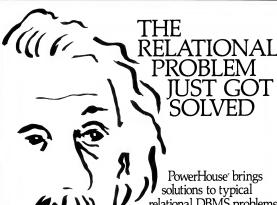
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MICROCOMPUTING

Prime time software

Having tried many calendar/ time-management programs. I had pretty much concluded that there was no way I would ever use any of them. None seemed to offer much practical improve ment over my \$5.50 Month At-a-Glance appointment book.

Upon receiving a review copy of Prime Time, a \$99.95 personal time-management system for IBM Personal Com puters and compatibles from Wiseware, Inc., in Costa Mesa Cald., I fully expected to be dis

appointed. As at turns out Prime Time is a useful program that stands a good chance of winning its way into the select inner circle of programs that I use regularly

A big part of Prime Time's anneal is the ease with which the calendar can be manipulated. A cleverly designed set of entry options and facilities for rear ranging things eliminates most of the inconveniences found in other time-scheduling systems

For example, Prime Time offers a flexible way of scheduling recurring appointments matically. An automatic date generator facility gives Continued on page 43

IBM cagey in granting licenses

IBM recentiv emphatically demed published reports and spec ulation that it has approached manufacturers of compatible systems about licensing the Micro Channel architecture used in three members of its Personal System/2 family

But while IBM has not activetried to license the Micro Channel technology, it reported ly will grant a license under a utility patent to interested manufacturers that clearly demonnot infringe on any other IBM patents. A company spokesman said IBM has some 10,000 utility

and identify which patent they have a peed for We don't tell them which natents are in the Micro Channel, nor do we clear their products." said Bob Liese gang, a member of IBM's commercial relations department. While several IBM spokes men failed to give specific exam

ples of utility patents as they re-

late to the Micro Channel, Chet

and from a tape drive Regardless of how you built it or what components you used to build it. you would own that concept. Heath said. Two patent lawyers inter viewed agreed that a utility pat

ent is a patent on a combination of steps, not obvious in nature that allows a product to function better than previous products. Continued on page 42

Memory up

for Amiga

BY DAVID BRIGHT

WEST CHESTER, Pa. - Hop

ing to boost its currently minor

penetration of business markets

ommodore Business Machines

an internal expansion chassis and more memory than previous

7.14-MHz 68000 microproces-

\$1.995, uses an optional add-on

board to run IBM Personal Com-

multaneously with packages de-

veloped for the machine's

puter-compatible software

Built around Motorola, Inc.'s

the system, priced at

Continued on base 42

recently announced an Amaga personal computer with

FCC hunts emissions outlaws

BY DOUGLAS BARNEY

ATLANTA - For the third Comdex in a row undercover Federal Communications Com mission agents scoured the Com dex/Spring 87 show floor in an attempt to crack down on products that fail to meet FCC radio FCC officials estimated that some 60% of computing devices investigated at Comdex earlier

this poorth failed to meet emis Investigators, however, did not visit the booths of vendors such as IBM which FCC officials said has a proven compliance

record. Officials declined to iden tilly vendors with products found to violate the standards pending Despite the large number of

uncertified devices, the level of compliance has been improving according to J. Jerry Freeman coordinator of the FCC's Computer Marketing Enforcement

Inside · Removable mass-storage

systems offer solution to data security, transport prob-

iems. Page 40 · Sharp readies shipment of transportable PCs. Page 42. · Microsoft releases Basic Compiler. Page 46

Intel's Bader says much of the future is here mg 386 control software and 32bit applications. That stands in stark contrast to the 286 and

> ne board mokers say it Is nearly impossible to de-sign a multifunction board for ISM's Micro Chonnel orchitecture. Does this

concern you? Our primary interest is not in selling hodgepodge cards but in providing a specific solution for specific customer needs. What I think is one of the significant opportunities in the Personal Sys tem/2 is to do expanded memory boards. Not only expanded but sumilar to today's Above Boards

where we have expanded memon and memory for US/2 com hmed in the same product. We hink high-density boards along those lines are doable Are you going to do ony

boards that are compati-ble with EMS and [AST Re-search, Inc.'s] Enhanced EMS? In our promon, there is no reason to do anothing like that

So it's EMS oil the way? You bet I think the reason some

people are interested in the oth er expanded memory technol ogies is because of the multitask ing capabilities that it provide: through some software pack ages. We think the best way to do multitasking of existing appli Continued on page 41

Firm plans to avert infringements on Micro Channel hus

Heath, who helped develop the strate that what they seek does Macro Channel design team cited a typical example "You could come up with a

concept of how to buffer data to

PS/2 Model 80-071



R.Base System V with coprocessor

d issues centering around Intel's 80386 processor and the IBM OS/2 operating system

er of Intel Corp.'s Personal Com puter Enhancement Operation, which is perhaps best known for creating the Lotus/Intel/Microsoft Expanded Memory Specifiaron (EMS) and the Above Board line of memory products.

An Intel employee for the nast nine years. Bader has held a number of marketing and strategic planning positions within the company. He has contributed to the development of the 80386 microprocessor as well as boardand systems-level products.

Bader took time out from his schedule at this month's Comdex/Spring '87 in Atlanta to talk to Senior Editors Ed Scannelli and Douglas Barney about a vari-

What are the prospects for the 80386?

Just as OS/2 is the software platform of the future, the 386 is the

hardware platform of the future Why? Because it's compatible with all of the software currently out there that runs on the 8086 and 80286. The 386 also has a number of unique capabilities such as its virtual mode that allows you to do 386 control soft ware, which is the only way to multitask existing DOS applications reliably. It also has 32-bit capabilities, and there a number of packages already taking ad-



vantage of that like Ansa Software's Paradox, Symantee's Q & A and Fox Software, Inc.'s Fox base. So while the 386 hasn't been shipping in systems for a

'Disks to go' offer transport ease, security

handled through mainframe vir-

BY JAMES A MARTIN

An increasing number of ven dors are selling removable massstorage systems, or "bard disks " as a solution to users data security and data transport

Conn , with its Bernoulli Box, was one of the first to introduce But in recent months, several

challengers offering their own

Disk-like floppies Some sell floppies that act as

Data Technology Corp. Santa Clara, Cald., offers Take Ten, a floppy disk drive subsys tem with up to 10M bytes of storage on a 51 -- in hard-coated

A similar product in appearalthough incompatible with Take Ten, was designed by

Both are manufactured by

Verbatim Corp. Meanwhile, Konica Technolngy. Inc., the languese-based camera company, unveiled last fall the KT-510, a 51x-m, floppy

disk with up to 10M bytes of floppy-disk jacket and is compati ble with 360K- and 1.2M-byte 51 cm floppies, according to the

vendor Because of its hard coating Kodak's Take Ten is not compatde

Floppy-like disks And there are hard disks that act

something like floppies Tandon Corp. has the PAC

286, an IBM Personal Computer AT-compatible that features indon's removable 30M-byte Winchester hard disk, The Data Pac, according to the vendor This product operates as the

main storage system and is encased in a shock-resistant how curnty of data, however, are expected to hinder the level of acceptance for these removable

high-canacity storage devices At E. F. Hutton & Co.'s headquarters in New York, large-

DBMS FOR THE

IBM SERIES/1 800-626-5518 502-633-5700 DI & APPLICATIONS TOO! tual-microcomputer disk storage and telecommunications

Ultimately, it is the promise If the data needs to be ported of future storage technologies to another location, a satellite that poses a threat to these prodwide-area network is used.

"We don't like sending data through the mail," said Berme ing high-capacity memory stor-

Weinstein, first vice-president in age and backup, are increasingly charge of information systems common and, in most cases, storage subsystems

Emerging optical-disk and compact disk/read-only memory

technologies are another threat to storage subsystems. Meanwhile, the storage ca-

pacity of 3½-in, nucroflop will only increase, and a 20Mbyte microfloppy will be a stan-dard after 1990, predicted Phil Devin, an analyst with Data

Dataquest also forecasts that chins, such as the kind used on automated teller machine cards will eventually become a key

storage medium

COMPUTERWORLD JUNE 15, 1987

Bader

FROM PAGE 39

cations is through the 386. It is much faster and more reliable than techniques used in the past. What is the potential of 80386 Windows, or of other control programs? While 80386 control software

CLEAR-CLT ACCESSIBILITY.

can't provide everything that OS/2 brings, it brings an awful lot of what users want today with a much smaller amount of discreption and change

Con on 80386 board in on 8088-based machine run 80386 cantral programs? We don't have a product like that vet. But as a statement of direction, it is my organization's in-

tention to provide a range of 386 enhancement products that will allow you to enhance just about any IBM PC AT and XT

Are there ony drawbocks ta running OS/2 on an in-tel board in alder mohines? There is nothing inherent in the PS/2 that we have seen that makes it run OS/2 faster or bet-

SHFFR

ter than the classic architecture.

iBM recently said you should count on hoving 3M bytes af random-access ory if you wont to run OS/2 Extended Edition Right. That's why Intel hasn't announced its memory card. All that is coming out so far are 2Mbyte boards for the Models 50 and 60. We believe 2M-byte

boards are insufficient

How technically feasible is it, aver the next year or sa, ta be able ta affer a 16M-byte memary unit an a single board? It will take megabit chip technol-

ogy to get there Wan't that take another three or four years? [Because of the packaging.] I don't think you'll be able to use

megabit chips and get 16M bytes on a board on the Micro Channel Are you lacking at expansion boxes for the PS/2?

There is a school of thought that says that by the time you are ning systems like that (with 16M bytes of RAMJ, the PS/2s are going to be obsolete, so that by the time OS/2 is ready. PS/2s won't be competitive machines anymore. So there really don't need to be any major strategic commitments to PS/2s, because two or three years down the road, you are going to want something new

What about the PS/2's ability to handle multiple processors? Doesn't that ive them a whole new set We believe the distributed pro-

cessing capabilities supported by Micro Channel are very attrac tive. However, there are a lot of different ways to do that, and any way you do that has to be sup ported by the operating system OS/2, as I understand it, doesn't provide the facilities to allow you to do all of that wondrous stuff. You'll be able to put multiple processors in to do communications and graphics, but to have multiple processors in there and to have each of them doing generalpurpose computing, OS/2 is not

is the technology now at a stage where on MiS/DP shop cauld begin to get at protected mode?

designed to do that

have been talking to a large number of customers with significant in-house development shops that, in some cases, are do ing mission-critical applications and pretty advanced research You can bet that all of those compames are going to 386 systems across the board and looking for LISP compilers to take advan tage of the 386s.

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Sharp reinforces assault on portable market

Escalates lightweight war with PC-, AT-compatible laptops boasting supertwist LCDs

ATLANTA — Sharp Electronics Corp. stepped up at a stack on the portable computer market be introducing two IBM Personal Computer Africompatible transportable systems and two IBM PC-compatible laptop systems earlier this month at Cimdex Spring 87.

Sharp is planning for shipments to be-

one is purming for suppments to begin-ometime in the third quarter, according to a company spokes woman. Of the four machines introduced, the

Of the four machines introduced, the two transportables currently fall under the U.S. trade sanctions against Japan, the and The transportables eath weigh approximately 21 lbs and are built around an Intel Corp. 10-MHz 80286 incorprocessive Both units come with 640K bytes of memory, expandable on the motherboard to 1.6M bytes, one expansion slot and serial and parallel poets as well as ports for booking up color and monochrome monitoring.

tors.
The systems also include supertwist
LCDs that are backlit and provide 640-by
200-pixel resolution with four shades of
aray. An 11 4-lb printer that attaches to

either unit is optional.

The PC-7202, with a preliminary price of \$2,995, includes dual 5% on 1.2M byte Boppy disk drives.

The PC-7291 bentatively priced at

\$3.995, includes one floppy disk drive and a 20M-byte hard disk drive. The laptop systems, which were designed around NEC Corp.'s V40 microprocessor, also use superfirst LCD

screens.
Prices start at \$1,295 for a unit with
256K bytes of memory, expandable in
1.6M bytes, one 30-in. floppy disk drive i
and a parallel printer poet.

IBM licenses

Some lawyers said they are eager to see how broad the IBM patent claims will be and al IBM has patented the entire Micro Channel. "It's always interesting whether they [the patents] will cover all computers that may have a similar systems architecture or maybe just a subclass of those computers that have feaclass of those computers that have fea-

class of those computers that have fea fures not too many people care about, said Gerald Lynch, an attorney with Ken way & Jenney in Boston.

The patents for which IBM has filled are not expected to be made public first at least 18 months. However, Heath and theirs at IBM cautioned that the Micro Channel architecture is made up of more consists of proprietary microcode and "other trade accretis," which fall under the category of design patents, which IBM said it will be accretis, which IBM said it will be accretis.

"While the Personal Computer was clonable, we have gone to great lengths to make the new one [PS/2] unclonable." Liesegang said.

Asked if it is technically feasible to produce a system confaring the Micro Chainnel with a blus or chip set that support for the existing architecture, Heath said it cruld be accomplished but that he did not see why anyone would want to attempt it.

"It was a tough job to baild that system," and Heath, who noted that BM began the project back in 1983. "And it's going to be a lot of work for somebody else, Of course, it's easier to copy someone else's work. But then IBM hand's changed its position on intellectual property rights, and we will take whatever steps necessary to protect them rights."

Amiga CONTINUED FROM PAGE 39

the vendor said. With the earlier Amiga

1000, expansion tools place externally.

According to Rich McIntyre, senior values of personal to fisles and marketing, the machine is useful for traditional business applications, such as word processing, financial analysis, accounting and data base minagement, as well as for graphic-sorting.

entied vertical markets like computer-and-eddesign and desktop video. McInity said more than 500 software packages are sufficiently available for the machine but added that before buying. "Users must first find or define a need for the Amga." The system is said to be computable with the Amga 1000. Some 120,000 Amga 1000 units were shipped between the product's late 1985 introduction and the end of 1988. according to International.

al Data Corp., a Framingham, Mass.based market research firm. The \$499.95 Bridge Board that pro-

vides IBM PC-compatibility is built around an Intel Corp. 8088 microprocessor, Commodore said, and comes with Microsoft's MS-DOS 3.2. In comparison, the external Sodicar MS-DOS option for the Airnaga 1000 lists for about \$1,000.

The Bridge Board requires a 5¼-in, floopy disk five. Commodore said it is

also planning an AT-compatible Bridge Board for introduction at a later date. System and Bridge Board availability are planned for this summer. McIntyre said a competitively priced hard disk drive will be available by Sentember.

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STORY STATE OF THE PROPERTY OF

Prime time CONTINUED FROM PAGE 39

two different and complementary ways of specifying dates. The select-a-date op tion lets you schedule recurring events

based on the date itself One can easily schedule events based on the "qualities" of the date. You might decide to schedule a meeting on every

Wednesday in the third week of each month, for example, or every Tuesday, or 10 days after the end of each quarter Alternately you can specify recur-

ring events based on a starting date and some interval (every three weeks, for example). Prime Time allows you to spec ify daily, weekly, monthly, quarterly and yearly intervals in integer multiples

Appointments can also be moved from one time or day to another. The duration of the appointment, notes associ ated with it and other pertinent informa tion move right along with the entry. But Prime Time does much more than just let you schedule and rearrange

Organizes tasks within calendar rhaps its handlest feature is a facility

for handling tasks to be accomplished. Like appointments, these can be entered either individually or as recurring tasks, such as preparing a monthly report. All of the automatic facilities for entering aptasks as well. Tasks are entered with a description.

onty and a type classification. At the option of the user, currently active tasks may be displayed in order of date, prior ts or type. Currently active tasks, as well as scheduled appointments, are associated with each date on the calendar.

Like dates, tasks can also be moved. sdified, added and deleted. In addition, tasks can be marked as completed. Com-

FCC

CONTINUED FROM PAGE 39

Program in Virginia Beach, Va. A year ago, some 80% of the devices investigated at Comdex/Spring '86 were

The wave threat Products that emit an excessive amount

of radio waves pose a threat by interfering with other devices, including police and fire department radios, as well as radios and televisions. FCC officials said The issue concerns users because the

FCC has the authority to force organiza tions to stop using uncertified devices if complaints are made about interference. In addition, computers that do not have the proper shelding may interfere with other computers, sometimes causing

them to spontaneously reboot, FCC offi crals said In addition to computers themselves. add-on boards - especially accelerator cards — must also be certified

FCC officials advise users uncertain of product's certification status to call the FCC, especially since an increasing nu ber of devices contain fraudulent FCC stickers

The FCC also provides a modern nun ber that provides information on the cerrification status of a variety of products.

pleted tasks appear on the daily task list with a line through them until purged by the user

Yet another innovative feature is the ability to delegate tasks. These appear as assigned tasks with the initials of the insigned. They appear on the daily task list when their completion date has arrived

The program can be simply stypked when needed or, alternately, can be run as a terminate-and-stay-resident task invoked through a hot-key combination. It requires 118K bytes of memory in the latter mode but is thereby instantly available for scheduling changes and so forth. Yet another appealing feature of Prime Time is that it also keeps a directoabout them that also can be used as an autodialer for telephone numbers through a Hayes Microcomputer Products, Inc. or compatible modern

Generous notes fields associated with the data base make it easy for a calesman for example, to keep key information about chents

On-line Help facility The program itself is menu driven, and an on-line - although not context-sens-

tive - Help facility quickly makes the user independent of the manual A "User Profile" menu gives the user ample control over basic options. Ap tment alarms may be set if desired and parameters may be established for how soon before the appointment the

alarm is to sound and for they long Appointments may be either over lamped or not depending on the user preference. The normal business die start and end times and schedule incre

ments may be set. Dual codes for funtions such as credit card calling may be specified and associated with telephone Prime Time is not copy protected and

ounte straightforward to install and use A good tutorial is included that provides an introduction to the features of the program All things considered, Prime Time is a useful program that delivers excellent



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NEW RODUCTS

Systems

Xepix Inc. has introduced a Unix-based ractive publishing system valled the Xepix Model BG

The Xenry Model BG is too kaged in a personal computer cabinet and comes with a high-resolution monitor with 1 milbon. 2 milion. 4 milion or 8 million displayable pixel- and monochrome gray scale or color with 256 displayable colors

out of 16 million. The text and graphics system is said to support two users The system operates at up to 5 million instructions per second, the vendor said and includes 1M byte of memory, expandable to 8 bytes, a 1M-byte floory disk drive; one expansion slot and one parallel and two serial ports.

The Xerry Model BG interactive pub-Xepix 51 Lake St., Nashita, N.H.

Saftware applications packages

Database Applications, Inc. has an ed a report-writing system called DNPL/Reporter, designed for use with Ashton Tate's Dbase III and Dbase III

Features of the software include report writing with English-like sentences for sorting, formatting and screening; statistics, joining of data from different files. and the creating of executable programs DNPL/Reporter also allows for the creation of tabular reports with totals, subtotals, averages and standard deviation arts. compound function, headings and current tune and date

DNPL/Reporter costs \$89.50 Database Applications, 400 Wall St. Princeton, N.J. 08540

Project Software & Development, Inc. has introduced Qwiknet Professional, a project management software program for the IBM Personal Computer AT, XT and compatibles

Qwiknet Professional is a multiple project, multiple-calendar software program said to measure actual performance in terms of schedules, expenditures and resource usage. It also produces standard project-management reports, such as bar charts, histograms and logic diagrams Other features include a proprietars

window environment, connectivity with the sendor's Project/2 mainframe and mmcomputer program and the ability to import and export other ASCII files Qwiknet Professional costs \$1,495.

Project Software & Development, 20 University Road, Cambridge Mass.

Saftware languages

Microsoft Corp. has announced the release of Microsoft Basic Compiler for personal computers running the Xeno

System V/286 operating system The product is said to allow programs written in Microsoft's MS-DOS version of Microsoft basic and GW-basic Compiler - as well as those written in Microsoft Basic Interpreter for the Xenix environ-

ment - to be compiled with little or no modification Microsoft Basic Commiser includes sunnort for Indexed Sequential Access Method and allows users to create and distribute stand-alone programs without requiring a copy of Basic to run them

The Microsoft Basic Compiler is praced Microsoft, Box 97017, 16011 NE

36th Way, Redmond, Wash, 98073

Saftware utilities

A software utility called Me2, and to pro vide fault-toleram disk operation for IBM Personal Computer AT-type machines. has been announced by Atlantic Microsystems, Inc. Me2 is said to use redundant on-line

hard-risk storage. It enables automatic backup of data on two separate hard disk drives within the same PC, so that both drives have identical comes of the data. Features include transparent backup and support for up to four 32M-byte parti-

Me2 costs \$285. Atlantic Microsystems, 8A Industrial

Way, Salem. N.H. 03079. Microway, Inc. has announced Powerdialer, and to provide users of Lotus Development Corp.'s 1-2-3 with automated dialing of phone numbers stored in Lotus

1-2-3 work sheets. Powerdialer supports automatic leastcost routing, local or long-distance exchange identification and extended localarea dialing. It comes with automated phone book and tutorial work sheets and documentation and is compatible with Haves Microcomputer Products, Inc.

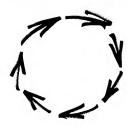
owerdialer costs \$79.95. Microway, P.O. Box 79, Kingston

Mass. 02364

Software enhancements

companile moderns

Vector Automation, Inc. has an nounced its computer-aided design software, Cadmax 2D and Cadmax 3D Version 3.0. which run on Compan Computer Corp. 386 personal computer



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PCs into a powerful network that allows you to share programs across PCs. Then there is the Bridge system which provides total connectivity and access between any combination of multi-vendor and multi-mertia networks. Connectivity that ranges from micros to host computers Of course the best hardware and software is only part of the right LAN solution. At NYNEX, your

system will be designed installed, and maintained by the network specialists with a 100 year heritage. in business communications So if you want the right local area network make sure you head in the right direction. To NYNEX

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Cadmax software features a two-level enu structure said to allow up to 75 English-language menu options to be displayed at one type

Cadmay 3D displays easter views on the screen simultaneously. Each view can be windowed and scaled independently. Construction tools such as projections, tan-

gency and object snapping are included. Cadmax 2D includes menu language, macro language, bill of materials and symbol geometry. It costs \$3,350. Cadmax 3D adds three-dimensional wire ime. It costs \$3,950.

Vector Automation, Village of Cross Keys, Baltimore, Md. 21210

Persoft, Inc. has announced Version 2.0 of its Smarterm 240 communica-

Smarterm is said to allow an IBM Persoral Competer or compatible to commumeate with minicomputer and mainframe hosts and to emulate the display and keyhourd characteristics of various Digital Economent Corp. and Tektronix. Inc. graphics and text terminals.

Version 2.0 is said to include emulation of the DEC VT241 color graphics terms nal and support for IBM's Enhanced Graphics Adapter when displaying DEC

Regis graphics images. marterm 240 is priced at \$345. Persoft, 465 Science Drive, Madison

Printers/Plotters/ Peripherals

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\$99.95

Network has introduced the Network A-B Switchbox, said to allow users to add an unlimited number of peripherals The A-B Switchbox utilizes RS-232 nections. It can link a personal com puter with a modem and printer even when the PC has only one RS-232 port,

nuters with plotters, terminals or other peripherals. The A-B Switchbox includes one input and two output connectors on the rear panel and a two-position lever on the front The A-B Switchbox is priced at

Network 1913 Atlanta: Ave. Manas. ouen, N.I. 08736

Toshiba America, Inc. has introduced the P321SL 24-pm dot matrix printer The printer is said to feature IBM em ulation and a tractor for fanfold paper. An automatic fanfold bypass allows users to print on cut-sheet paper without removing the tractor-fed paper. Printing modes are accessed by touch controls. Printing modes include font, petch, emulation, lines per inch, page length and four preset printer setup configurations

Other features include 32K bytes of dent memory, 216 char./sec. printing in draft mode and 72 char,/sec. in letter-

The P321SL is priced at \$749 Toshiba, 9740 Irvine Blvd . Irvine. Calif. 92718.

Board-level devices

The Juki 7200 24-pm flatbed-type do matrix printer has bowed from Juki Office Machine Corp. The Juki 7200 is said to feature a front and rear paper-loading capability as well

as the ability to print multipart sing forms. Print speed is 90 char./sec., 108 char./sec. in letter-quality mode and 270 char./sec. and 324 char./sec. in draft



The Juki 7200 dat matrix brists The July 7200 comes with a 7K-hyte buffer memory and features Centronics chios costs \$1.395 FUJITSU'S 24-WIRE DL2600 PRINTER

The printer

that stands

Throughout each business day, the

Coffee is just starting to brew but

the new DL2600 in Purchasing is already

wide awake, printing reports at a blazing

9:22 AM — GREAT PAPER

Marketing needs a proposal on letterhead.

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naper then loads the letterhead. Getting

back to the reports is as simple as pushing

DL2600 24-wire, dot-matrix printer will

quietly and reliably handle your

* 8:35 AM — EAST!

printing needs

ten seconds per page.

HANDLING!

Data Computer Corp parallel or RS 232C senal interfaces The luke 7200 is priced at \$2.445

luki Office Machine, 20437 S. Western Ave., Torrance, Calif 90501

Computer Peripherals, Inc. has an-nounced the 386 Memoire, an add-on memory board for the Compaq Computer Corp. 386 Deskpro.
The card is said to operate in the host's 32-bit mode at speeds up to 16 MHz with no wait states. A 25-pin connector match-

es the connector in the Deskinto that provides access to the 32-bit memory A 1M-byte board using four banks of 256K-byte chips costs \$845 A 2M-byte board using eight banks of 256K-byte

Computer Peripherals, Suite 5, 2633 Lavers Court, Newburs Park, Calif.

MSA Group. Inc. has reduced the price of its Turbocad two-dimensional puter-aided design system for the IBM

Personal Computer and compatible-Turbocad is said to feature automatic sanning, advanced drafting features and dot matrix printing. It uses pull-down menus and offers a context sensitive Hein facility. It provides up to 256 line thicknesses: 100 line and arrow types, user-definable hatching patterns and grid, unlim ited zoom, and three cursor types Turbox ad is proved at \$99

MSA Group Suite 370, 12021 Will shire Blvd Los Angeles, Calif. 90025

1:31 PM - QUIET!

A meeting on the quarterly statement is held while the DL2600 quietly purrs nearby, printing spreadsheets for Finance 3:15 PM - POWERFUL! the test of time. Time to handle a mailer for Sales.

Lising the 16-character English language LCD front operator panel, its simple to change type styles, including big letters

and italies, too

7:30 PM — GOOD INVESTMENT! When you look at the productivity, the

quality the different kinds of printing

handled during the day the DL2600 makes your company look good on paper.



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formance and reliability, we're not blowing smoke.

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NETWORKING

DATA STREAM

Patricia Keefe

Networking roundup

Thirty-four and counting flavors of Netware. Despite rumors that Novell, Inc. is working on a Unix version of its Netware networking software, Novell Vice-President Craig Burton maists that Universe't exactly high on Novell's list of priorities

On the other hand work on Macnetware is progressing niceby Burton declines to say whether Novell's Netware for the Apple Computer, Inc. Macintosh will be out before the end of the year, but he does say Apple and Novell were working

closely on the project. It seems Apple has found a new attitude as far as Netware is concerned.

Fall fashions. Rumors about an Ungermann-Bass, Inc.-IBM OEM contract continue to circulate. The deal has Ungermann-Bass supplying either Transmission Control Protocol Internet Protocol or Ethernet (or both) to Big Blue, depending on the source. Whichever,

don't expect to see an announce Continued on base 50

Race is on to network PS/2s

BY ELISABETH HORWITT Support for IBM's Personal Sys

tem/2 product line has become the latest competitive yardstick among networking archrivals 3Com Corp., Novell, Inc. and Banyan Systems, Inc. But while all three companies are racing to migrate their networking software to the currently available Microsoft Corp. MS-DOS 3.3-

PS/2 family, they are taking longer than some users would like to come up with boards that can interface with IBM's new

Micro Channel bus Both 3Com and Novell claim that this month they will begin shipping the PS/2 Micro Channel sions of their network software suites. But the software is not much good without network boards that interface with the

dard bus for PS/2 Models 50, 60 and 80. And those interfaces are currently in short supply, according to industry sources.

Right now, only one com ny provides Token-Ring and PC Network boards for the PS/2 --and that's IBM," said Scott Haugdahl, senior systems specalist for Minneapolis-based consulting company Architec-Continued on page 51

Care and

feeding

of a LAN

BY ELISABETH HORWITT

HOUSTON - In 1985, when

The M. W. Kellogg Co. was in

the midst of exchanging Four

Phase Systems, Inc. office auto-

mation systems for Digital Foundment Corn minicomput-

ers ats MIS technical staff took

advantage of the general trans-

tion to justify a local-area net-

Continued on page 52

CXI boosts gateways

Novell Netware link, 40-session gate debut

BY ELISABETH HORWITT

ATLANTA - A 40-session network-to-mainframe gateway and a gateway that supports parent company Novell, Inc 's Netware were among the introductions made by CXI. Inc. at the recent Comdex/Spring '87 show

CXI's PCOX/Coax-Mux coax ral interface board is said to convert an IBM Personal Computer or Personal System/2 into a local-area network (LAN) gateway that supports up to 40 concurhetween networked PCs and an IBM mainframe host through an IBM

Prior to the product's introduction, "No vendor could support more than five sessions on a LAN extensive to a cluster con-Novell Vice-President Crave Burton claimed

The PCOX/Coax-Mux gate-Continued on page 51

Inside

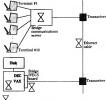
. U.S. Robotics strengthens alternative modem standard drive. Page 50. · Mitek distributes SNA services to TCP/IP LANs

Page 53.

CCITT and DDN X.25 support for gateway servers. Page 53

M. W. Kellogg draws response time from a soda straw

While MIS has developed a rough and ready way to test respons time over a given server-to host connection, it has not yet investe in a product to puntoint bottlenecks across a Decnet-XNS LAN



work (LAN) for the engineering firm's 20-story beadquarters Two years later, the LAN consists of some 50 Bridge Com munications, Inc. Ethernet serv ers linking 400 user terminals as well as multiple DEC, IBM and Hewlett-Packard Co. hosts ind assorted peripherals. The

printf("Hello, world\n");

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easy to follow and errors easy to find An extensive library offers functions from Kernighan and Ritchie and the Lattice PC C compiler The run-time library produces explicit numbered error messages and a traceback of a calls if an error occur

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U.S. Robotics seeks standard

BY DONNA RAIL-ONDI

SKOKIE, III. - U.S. Robotics, Inc. strengthening its drive to promote an alternative CCITT V.32 dial-up modern standard, has signed an agreement with Data Race, Inc. in San Antonio, Texas U.S. Robotics will provide Data Race with microprocessor source code, schematics and parts required for manufactur-

mg an asymmetrical full-duplex 9 6K bit. sec. dol-up modern that is compatible with U.S. Robotics' Courner High-Speed Technology (HST) modern, In exchange, Data Race will give U.S. Robotics the technology that describes split-speed mo-The \$995 Courser HST modern uses

an asymmetrical, full-duplex modulation technique that divides a dial-up phone line into high- and low-speed channels, automatically assigning the high-speed channel direction based on data-flow demand. The modern uses trells-coded modulation on the high speed channel

There is a huge marketplace where true [symmetrical] full-duplex is not re-" said U.S. Robotics President Casey Cowell. Building modems to V.32 specifications is expensive and complex,

with conforming moderns costing from \$3,000 per piece, he said A statistical multiplexer — where input from many operators is crunched into a single chanel. sent along the phone line, split out again and sent back the same way — would be an ideal use for V.32 standard

modems, he explained. U.S. Robotics, along with Telebot Corp. and British Telecom, have proposed their dial-up modern schemes to Study Group 17 of the CCITT committee, said Dale Walsh, vice-president of engineering at U.S. Robotics. The three conpanies, along with a variety of govern-

ment administration groups and communications curriers in the study group, should decide on a non-V.32 standard for dual-up by the fall, he said.

Net roundup

ment before the end of the year, a source close to the company says. Incidentally, it's a smart IRM simplier that keeps an alternate plan on the back burner. Fickle 1BM 15 wont to dump partners when they least expect it (witness Sytek, Inc.'s

What's going on? A surprising and growing number of industry analysts and users seem to think there's more than meets the eye about IBM's 14-month shortage of Token-Ring network boards. Hardly anyone buys IBM's standard excuse of backlogged orders. Hey Armonk, even the immensely successful Personal Computer AT was never in short supply for that long. One popular theory links the scarcity of adapter cards to some mysterious IBM agenda.

Serving all LAN-kind. A group of Charagnarea network dealers have launched LANDA, the Local-Area Network Dealers Association. This would-be national organization is seeking chapters in 15 major cities nationwide. What's in it for network managers? Increasing profeconnalism and better service and sim port from your local supplier, not to mention industry gossip

When it rains, it pours. The August issue of LANDA's "The Network Report" takes a close, critical look at "the eclipse of Proteon." The report notes that the token-ring vendor has been plagued by a number of ills, among them an inability to get along with Novell, which no longer distributes Proteon its "complex and not well-understood product": numors that the company is discreetly looking for a buyer: "lacklus-ter" marketing and "premium" pricing: and the departure of the majority of its regional sales personnel and its vicepresident of sales. The report adds, with a final jab, "You can see why we might want to suggest a closer look before an unequivocal recommendation of Pro-teon is made." Well, I guess so.

Marriage made in heaven? One rumor racing through the financial community a few weeks ago had Microsoft Corp. buying 3Com Corp., its partner in LAN Manager development. "It's not as farfetched as you might think," says Dave Terrie, editor of Patricia Sevbold's

Network Monitor" newsletter. Micro soft is looking for a way to mesh dealer sales - 3Com's forte - with OEM sales he adds. Other arguments for such a match, says Thomas White, president of the Consulting Group of The Scybold Group, Inc., is 3Com's need to be perceived as a software company. Microsoft's limited grasp of the networking business and both firms' perception of Novell as a major rival.

Another stock to watch. Don't be surprised to see Fox Research Inc. no. nublic by year's end. Fox executives hinted at Comdex/Spring '87. Also re portedly coming from Fox is support for IBM's Token-Ring as well as Ethernet

Keefe is a Computerworld senior editor, network

Race is on

CONTINUED FROM PAGE 49

ture Technologies, Inc. And yet this monopoly does not seem to be giving IBM networking products any significant sales advantage over 3Com and Novell, according to Robert Nash, a regional support manager for Richmond, Va.-based value-added reseller Little Systems, Inc., better known as Dardick. "I have one client, a law firm that is implementing a 200-node network which chose PS/2 Model 30s over Model

50s, because the Novell network works on a 30 but not a 50 as yet," Nash noted. The Model 30, unbke the higher end PS/2 models, does not incorporate the Micro Channel. The chent chose Novell software running on 3Com Ethernet cards — Model 30s for workstations and "Compaq Computer Corp. units as servers, since the Model 30 is not nowerful

enough for this job," Nash said. Customers are unwilling to go with IBM's networking hardware for two reasons. Nash said. 'First, they don't feel the IBM Token-Ring is as proven as Ethernet: second, the Token-Ring cards are not easy to get," he said.

Settling for stopgops

Dardick has sold a let of 3Com and Novell networks to customers who would "sure like the high-end PS/2 line for servers but are willing to settle for stopgaps until the third-party vendors come through with PS/2 support - hopefully later this year, Nash added. Once the Micro Channel PS/2 interfaces are ready from Novell Company and Model 30s into high-end workstations, Nash noted.

3Com has announced an Ethernet adapter that will interface with PS/2 Mod els 50, 60 and 80 with 3Com's Etherser ies network, which in turn supports the vendor's 3+ networking software suite however, shipment will not be until "sametime before the year's end," said Jack Moses. 3Com's Ethernet product

The Micro Channel's new architecture, which incorporates smaller expan sion slots, and a 32-bit bus for the Model 90 version have stamind vandors other than 3Com. Alloy Computer Products.

CXI gateways CONTINUED FROM PAGE 49 way is said to work in consinction with th

new Coaxial Multiplexer version of CXI's PCOX/GW-3270 server software to ade host connections to both IBM PCs and PS/2s on a LAN. The gateway is priced at \$1,100, and

the software costs \$850. Both products are slated to be available in July. PCOX/GW-3270 software will also run on PCOX 1BM or Digital Communications Associates. Inc. Irma coasual boards or with PCOX remote boards, according

CXI also announced that all PCOX 3270 coaxial and remote LAN-to-man rame gateway software will now support well's Netware SPX LAN interface The Netware SPX LAN interface is said to allow from five to 64 host sessions

to be distributed to IBM PCs and PS/2s on a Novell LAN, depending on which PCOX gateway is used. CXI said.

Inc. introduced the Hi/2 Micro Channel host interface adapter at Comdex/Soring The adapter links the vendor's PC XBus and Plus4 networking systems to the PS/2 Models 50 through 80. But the Hi/2 does not take advantage of the Micro Channel's greater address space, admitted David Friesen. Alloy director of strategac marketing. Alloy is working on slave CPU cards that can link directly into the Micro Channel, but 'it could take a while, since the Micro Channel requires that we fit everything into a smaller card." Frie-

Bancan whose specialty is network rvers that support a wide variety of local-area network (LAN) interfaces, also appears to be struggling to overcome the Micro Channel barrier. The company is

currently concentrating on developing a PS/2 Model 80 version for its Virtual Networking System (Vines). "For the Model 80 to be a server will take a Vines rewrite - more than just software driv ers but a whole new bus structure," said arol Wolicki. Banyan spokeswoman. The company has promised to eventually

bring out Vines for the less powerful. Intel Corp. 80286-based Model 50 and 60, but this project is not a high priority. Wolick: "We don't think there is a big demand for the Model 50 and 60 as serv-"sheadded

Both Banyan and Novell support PS/2 Models 50 and 60, as well as the IBM Per sonal Computer-compatible Model 30. as workstations on their networks "We already support IBM's Token-Ring Adapser/A for the PS/2 and the Ps. LAN program which is all that is needed too workstation support. With keeped

Also at issue to when and wheth various third-party networking vendorwill migrate their systems to IBM - tuture releases of OS/2 and Extended OS/2 No vell reportedly has not yet committed it self to producing an OS-2 version of

3Com is "working with Microsoft almost dails so that we can be first with an sometime in the first quarter of 1988 ' Wom Charman Robert Mer. allesaid But 3Com has made no communicati to Extended OS/2 "We don't even know how much of the system BM will reveal to third parties!," Metcalfe said

FORTRANS-IGRAT



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But don't take our word for it. Listen to a moving professional: "RM/FORTRAN lets my move many.

of a commessor.

Care of LANs

technical staff has learned a number of new skills in its efforts to ensure that us ers can access those resources in a reli-

able and timely fashion. Networking has greatly increased the efficiency and cost-effectiveness with which these resources are delivered, ac-

cording to Michael Key, MIS manager for computer technology at M. W. Kellugg. The company's pre-LAN installation used 'miles and miles' of different types of cabling systems to support various computers, and users frequently had both asynchronous terminal and an IBM 3270 terminal on their desks, he explains.

Now, all computer equipment shares rine cabling system, and Bridge servers and protocol converters enable users to access all network resources through one

However, the LAN installation has been a mixed blessing for MIS technicians whose job it is to maintain networking hardware and software and to ensure ac centable service levels on the complex multivendor network. The acquisition of two of Bridge's Network Control Server (NCS) 150s has greatly eased that load, cording to David Malacoff, who heads M. W. Kellogg's technical support staff in charge of LAN network management and

development For example, Malacoff says the NCS 150s allow him to maintain and manage

the interfaces on all 50 Bridge servers from a centralized location so that he no longer must "run around the floors" do-

ing manual updates Prior to the NCS 150s' installation, Malacoff had to go throughout the headquarters to collect server-resident floppy disks that contained Ethernet addresses protocol translations and configurations for each port as well as macros that make it easier for users to perform basic network functions such as log on and routing He says he would then bring the floory disks to his office, update them to reflect changes, do a series of backups that took

up to two hours and put them back in the servers.

Now, he says he can store all of that information on the NCS 150s, download it

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remotely to backup disks and update con-

figurations on the servers. The NCS 150s also mon and notify the operator of network failures. They collect network data and upload it to a DEC VAX for later analysis An internally developed software program analyzes user productivity based on the amount of time spent on the network. and an SAS Institute, Inc. SAS System application generates error reports and

network-utilization curves. Measuring network traffic for nosuble resnonse-time bottlenecks is complicated by the fact that the Bridge portion of the network uses the Xerox Corp. Network Systems (XNS) communications protois, while the DEC portion uses Decnet While the Ethernet LAN carries both types of packets, the NCS 150s are proammed only to monitor XNS packets and thus cannot collect Decnet-generated traffic statistics, Malacoff explains. In addition, M. W. Kellogg has developed its own software for measuring response time on the DEC Vivoluster

When the software reports that response tyme exceeds 10 seconds programmers monitor the system to determine which user and workstation are responsible for the overload. However, the programmers lack tools for determin and whether the problem is network- or

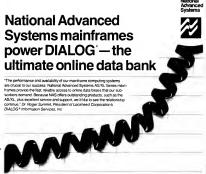
The company's Ethernet is not overloaded at this time, so the lack of an overall network monitoring system is not a se rious barrier to maintaining acceptable response-time levels. However, the vol ume of Decnet traffic is growing as M. W. Kellogg adds IBM Personal Computerbased graphics workstations that download files from VAX-based systems from Intergraph Corp. MIS is, therefore, on the looknut for a network analyzer that can bandle both XNS and Decnet packets, along with other protocols such as Transmission Control Protocol/Internet Proto cel. One product under consideration is Saatier from Network General Corp.

The sada straw test

Meanwhile, M. W. Kelloggs' MIS technicans have invented their own inelegant but effective method of measuring response time across the network. It is dubbed "the soda straw test" because straws are used to keep the autorepeat keys depressed on all 10 terminals on a Bridge server. As each terminal is added to the test, statistics are taken to measure the server and host performance to determine the network capacity as the load in

M. W. Kellogg estimates that one terminal with the autorepeat key depressed is equivalent to eight concurrent users on the network. Performance statistics, such as number of packets and bytes sent per second, are taken from the servers as each terminal is added to the test. "The soda straw test is an attempt to solve a perceived performance problem by halancing flow control across the network servers and the buffers on the VAX." Mabrooff save

The MiS technicians have found, how ever, that network performance is not always a matter of numbers. The commons established a help desk as a focal point for user calls and queries on all computer-related problems. Between 50 and 60 calls come in on "good days" and more than 150 come in on "bad days," the firm says Approximately 20% of all calls relate to network problems, according to Key.



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NEW P 00007

Lacal-area netwark hardware

Compression Labs, Inc. has intro-duced Rembrandt 56, a full-motion. desktop color-videoconferencing system said to support coast-to-coast video calls. Rembrandt 56 is a video coder/

decoder that is said to allow users to place video calls over private and switched data networks. It offers user-selectable transmission speeds from 56K to 384K bit/sec. Features include digitized voice, data en-

cryption and enhanced graphics. Rembrandt 56 integrates with Com pression Labs' Rembrandt Desktop Video Station and IBM Personal Computers and compatibles for local-video conference over a local-area network and with dedi-

cated or switched networks Rembrandt 56 costs \$68,000. A fivestation deskton videoconference system costs about \$115,000. Compression Labs, 2305 Bering Drive, San Jose, Calif. 95131.

Lacal-area network saftware

American Video Teleconferencing Corp. has upgraded its In-Synch teleferencing software, which is said to allow personal computer users to compute

In-Synch allows users of the same application package to run the program s multaneously and interactively on differpersonal computer workstations. Enhancements to the software include support for the Lotus/Intel/Microsoft Expanded Memory Specification and com patibility with IBM Personal System/2

In-Synch is priced at \$295 or \$495 for

a package containing two units.

American Video Teleconference 110 Br-County Blvd., Farmingdale, N.Y.

Network management

Mitek Systems Corp. has announced implementations of its Systems Network Architecture (SNA) Presentation Services for Digital Equipment Corp. VMS-based VAX and Microvax commuters and IBM PC-DOS-based Personal Computers

Mitek distributes SNA 3270 and SNA 3770 services to Transmission Control Protocol/Internet Protocol Ethernet local-area networks. The services are said to manage and share, in real-time, the necessary protocols and functions between a homogeneous SNA environment

and a diverse Ethernet network. The SNA Presentation Servers are

It's a Jungle. Let DPS be your Guide.

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priced from \$21,000 to \$29,500 Mitck Systems, Suite 100, ennault Drive, Carrollton,

Texas 75006.

Enhanced versions of the 5251/11 and 5251/11 Plus comr nunications boards designed to allow IBM Personal Comput nd compatibles to communicate with IBM's System/34, 36 and 38 minicomputers via twinaxial cable, have been intro

duced by AST Research, Inc. port IBM 5251 Model 11 and 5291 or

5292 Model 1 terminal emulation as well. Protocol/Internet Protocol and X 25 net as an advanced bedirectional file transfer system On the enhanced 5251/11 Pluthe ability to run up to seven display and eninter sessions concurrently is also san

The 5251/11 and the 5251/11 Plus cost \$892 and \$995, respectively AST Research, 2121 Alton Ave Irvine, Calif. 92714

Pratacal canverters

Cisco Systems, Inc. has entroduced CCITT X.25 and Delense Data Network X.25 standard software support for its AGS gateway servers AGS systems may now be configured interconnect Transmission Control

Prices start at \$11 598

Cisco Systems, P.O. Box 473, Menio Park, Cald, 94026

File servers

The Network Connection, Inc. has mnonneed a line of file servers The line of six models includes the TNC/A, with 10-MHz one-wait state (iparation. 1M byte of randomica cross ment ory . 1 2M-byte floppy and 40M-byte hard disks. The TNC Bis idents alto the NC A except for an 80M-byte hard disk

Prices range from \$4,500 to \$17,850 Network Connection, 1352 Union Hill Road, Alpharetta, Ga. 30201



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SYSTEMS & PERIPHERALS



High-speed race heats up

field is speeding along as fast as the trains that the technology's boosters think can someday be driven by superconducting motors, and the benefit for computer users may arrive sooner than service conected even as recenthe as a few months and

Competing research laboratories seem to be playing leapfrog with their claims of break throughs in the development of materials that can carry electricity without resistance. The substances are seen as useful in transportation, power transmission and computers.

The talk about superconductors may appear esoteric at present. For example, one of a string of announcements from IBM in April laid claim to the development of materials that operate at temperatures high enough to be of practical use. That temperature was 68 de grees Kelvin, which equals 337 degrees below zero on the Eabrenhert scale and is much much cooler than the average computer room. Such numbers Continued on page 67

Users say DPS 7 top system

Survey shows Honeywell boosts overall satisfaction: Amdahl posts gains

BY TAMES CONSOLTY

DELRAN, N.I. - Once the lowest ranking vendor in user satisfaction, Honeywell Bull, Inc. continued a climb to the top. where it joined Amdahl Corp. at the head of the list, in the 1987

Datapro Research Corp. report on mainframe user satisfaction Honeywell Bull's gains came from the strength of its DPS 7 small mainframe and took place best scores and some of the four years after the company sat worst results, particularly with

at the bottom in overall satisfac-Meanwhile individual sys-

Five of the sox vendors rated by users received higher overall satisfaction scores than they did in the 1986 survey. The only company that saw its score slip was Unisys Corp., which scored better as Burroughs Corp in 1986 than as the combination of Burroughs and Sperry Corp. this year. However, Unisys had the distinction of posting some of the

tems cited for special ment were Honeywell Ball's DPS 7, the IRM 3090 and Amdahl's 580 senes. No systems earned the specal ment rating last year, which entails an overall satisfaction score of at least 3.2 on a four-

point scale, at least 20 user responses and no ratings lower than 2.8. Datapro, a market research Continued on page 65

computing is still fertile ground for IBM competitors to pene trate IBM mainframe accountaccording to a recent study by

The Sterra Group The progress recently made by Digital Equipment Corp. and others will not abate in the im mediate future, the market re search firm, based here, reported. On the contrary, their departmental momentum will continue as satisfied customers add non-IBM - particularly DEC — equipment to existing installations. "DEC users are happier than IBM users, both in departmental systems and networking," said Marty Gruhn Sierra Group vice-president. "DEC will remain IRM's most formulable commentor through 1987 and, barring any missteps through 1988. Where DEC has already made its inroads into its Continued on page 66

IBM CPU

field still

vulnerable

B) STANLEY GIBSON

TEMPE, Any - Departmental

UPDATE

The long arm of the portable



BY ROSE MULA

ten Jerry Short, manager of court consulting services for the California Judicial Council. needed help monitoring the state's current inventory of 200 million court cases - plus 18 million new cases per year — he found his solution in the supermarket: bar codes and portable data terminals.

Short's use of portable terminals is no longer so unusual. Sales of such devices are soaring, causing a flurry of activity among niche vendors that are scrambling to claim

Kidder, Peabody & Co industry analyst Gray Glass estimates that sales in today's

- · Household Finance brangs info pools under one roof. EMC VAX boards use 1Mbit RAM technology. Page
- · Mitsubashi adda analogun nut color monitor. Page 68

► IBM 5270 and System /54/56/58 Users:

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with the WY-530 monochrome or WY-630 color monitor and get outstanding performance. For

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VOLUMEVER RECRET A WASE DECISION

Firm swan-dives into networking waters

Household Finance unites 50 varied workstations into single information net

BY JEAN'S BOZMAN

PROSPECT HEIGHTS, III. - Until recently, managers at Household International. Inc., the parent company of House hold Finance Corp. (HFC), worked on nearly 50 unattached workstations, about 10 of them IBM Personal Computers, In some cases, vital information was stored on index cards and in manila folders and could not be accessed by others at the head office of the \$2.7 billion corporation.

But recently, Household International decided to leverage the separate pools of information into a single network. The company now uses departmental computers to manage its Household Financial Services Group and Household Manufacturing. Inc. subsidiaries

HFC is part of the financial services group, while Household Manufacturing makes the Thermos and Scoteman brands of household goods

This systems concept of tying the varted workstations together has connected the freestanding PCs and NBI, Inc. workstations into a coherent system managed by NBI System 66 and Series 500 mincomputers. Strands of twisted-pair wires connect what were previously islands of

The NBI minocomputers now act as file servers, repositories of micro software and gateways to high-speed laser printers scattered throughout two floors of the firm's offices

Until 1985, the IBM PCs and worksta tions worked alone, generating reports and documents. They were widely stewed as word processors from the time Household International bought its first NBI workstations in 1983. Originally, they were not intended to be linked through local-area networks (LAN), with the exception of the tax department's IBM PCs. which are linked over an IBM Token-Ring LAN to access data from an IBM main

Perception changed The perception of the NBI machines as

ward processing engines has changed drastically in recent months, says Office Systems Administrator Dina Norton "We perceive NBI not as a vendor of dedicated word processing systems but as a total office automation systems providshe says Users are being encouraged to make

use of the NBI network, Norton said, but are not numbed into it. "If a user comes to us and wants access to NBI files, we sup port that on his workstation. But we don't gn out and push them. The 50 workstations are mostly used

by the 180-member staff, many of whom are middle-level managers, secretaries and executive assistants.

Norton says that even with the changes in the system, few executives use the workstations and PCs. One thing changing some executive work patterns is the ability to do "what-if" analysis with Lotus Development Corp's 1-2-3, avail able to NBI workstation users from the System 66 file servers.

Word of mouth generally does what formal computer training sessions i not, bringing more end users into the NBI

Management of the NBI systems is the responsibility of Geoff Young, director of corporate information systems for Household International, who acts as a systems administrator

In-house expertise

In addition, there is a full-time systems analyst who is able to program in Microsoft Corp.'s MS-DOS and Unix. This inhouse expertise allows Household International's systems management to be handled separately from the subsidiary corporations' MIS groups, which use IBM 3090 and 4381 mainframe systems in their production work NBI's philo-ophy of adding new architectural elements while protecting user investments in older equipment is the un-

derlying theme at the Household International site, according to Gars Sobol manager for systems engineering at NBL So while some of the older NBI 4000 workstations are still in use, all the file servers were upgraded in January to up-to-date models on lease from NBL

A significant new element in the NBI system is the addition of five NBI 510s

this month. Ron under an NBI-mounted Berkeley's Unix 4.2, the ministenpaters orp Units and the BRS-Information Technologies BR's Search data tose our

NBI's communications are hite-ture from all the Household International workstations, including IBM PCs to be stored in the central Unix DBM% 'Household has been a language user

of our word processing and PC applications "Sobol says," and they, like many of our other large costoners, are finding their productivity is creatly increased by moving toward departmental comput

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Portables 8 4 1

hand-held terminals market are \$400 million, plus or minus \$50 nullion "However," Class says "the market, if you assume full saturation for all of the applications that are defined today, has much as \$8.5 billion." An esti mate of market notential found ed on more realistic saturation figures. Glass says, is still be-

tween \$4 billion and \$4.5 billion One reason that the sales potential is so high for these units is because, as Jerry Short can at test, portable terminals are no longer limited to traditional work-at-home or retail uses. An increasing number of companies are finding them useful to track inventory or documents, enter orders or read utility meters Glass says terminals will be commonly used in "warehousing, factory control and package

The California Judicial Coun al purchased portables. Short SAYS "because we have the same problem as grocery-store ms and other large industrial and production operations that is, gathering data to help track the status, aging and loca tion of huge amounts of invenory at any given time. Their inventory is goods of one sort or another; ours is court cases. We figured if bar coding could do their job, it could also do

tracking for freight forwarders

That turned out to be a valid conclusion. Bar codes read by small hand-held ter minals - Telxon PTC-701s - maoufactured by Telxon Corp. in Akron, Ohio, are in deed beginning to cut the California court system's overwhelming case-han dhng task down in size

Courting micros California has 300 courts. ranging from some of the

amattest least sophisticated in some of the largest and most complex in the counto: Eventually each of these courts will have a microcomputer installed, to which up to 3,000 data collection points throughout the court system will be able to transmit in-

We felt we needed a main frame application to handle this monumental task." Short savis. but installing CRTs at each of these 3,000 data collection sites rimely wasn't fraulte The hand-held solution gives us econnmy simplicity of use with very bttle training, complete nortabil ity, decentralization and an efficent way to capture data on a real-time basis at the point of nri-

All of this, plus speed of data entry using bar coding and an er ror rate of only one in three million scans, compared with a key board-entry error rate of about one in every 250 to 300 keystrokes, make the court system's use of portable terminals extremely productive.

Here's how the procedure works: A har code label with the case number is affixed to the file sacket of a case when it is opened at the individual court. At each stage of a case, a clerk scams bot! the bar code on the file as well as appropriate codes on local hard copy menus, and the Telxon unit matically documents the acson taken, the date and the time. In a criminal case, for example, codes are entered from the hard conv list for arrest, advisement of rights, charges, plea, arraign-

This data is transmitted dail: through a direct-connect RS-232 interface to the microcomnuters of the court or courts involved in each case. There, in turn, the statistics are compiled, massaged and error-checked and then forwarded automatically via a 9.6K bit/sec, modern to the California Iudicial Council's per sonal computers in San Francis-

ment, trial dates, surv selection

and so on, until final settlement

co, which is Short's bailtwick. Making it easier

In addition to streamfining the collection of data, the Telxon apnlication also greatly simplifies tracking of case files. Because of our staggering

(Scan this code efter the july is see try the rease) COMPT TRUM. - SHORT CHASE Scan this code ofter the first extress is cutin in a court trial that is assimated to take five hours or less to bry 2

COURT TRUM - LONG CAUSE Scen that code efter the farst or teens or a court trief that at all take more than fine hours to try

POST DISPOSITION NEARING can this rode for each bearing that is hald fig: a disposition has been entered ! A bor code menu used by the Supers or Court of California. volume, files often got lost for

weeks going through the system." Short says, "With her codes, at any time during or after a trial, we'll be able to locate a file immediately and scan the bar code to ascertain a case's cur-rent status." This is achieved by scanning even more bar codes that may, for example, be on an employee badge or location card as the data collection norm

The California Indicial Coun oil chose Telxon terminals after extensive product evaluations and a widespread bid process. They weren't the lowest bid-Short reports, "but they had the best price/performance ratio, as well as a history of providing excellent service and devoting resources to developing new applications

To date, 40 courts in the sys tem are connected to 700 Telxon-equipped data collection sites with the remaining 260 courts acheduled to follow within 12 to 18 months. Short estimates that the total system will cost between \$5 million and \$6

land-held takes the cake Meanwhile, at Oakland. Calif. based Mather's Cake & Cookse Co., life is sweeter these days for administrators and sales representatives, thanks to their new Route Commander - no, not a recently hired, benevolent boss but another hand-held terminal - the one the Model 121YL a product of Norand Corp. in Cedar Ranids Inwa

According to George Ryer son. Mother's Cake & Cookie's director of information systems and communications, the Route Commander gives Mother's Cake & Cookie's sales and deliv ery personnel instant access to customer lists and any helpfui mformation about each customer. inventory of their trucks, up-to date prices on more than 80 products and information about

daily promutional specials This last item alone is worth the price of the unit. Riverson "We may have seven, eight SAYS. or more products on promotion at any given time, and they change frequently. It's very easy for a salesperson to forcet to mention one or more to

his customers. But now, his hand-held unit reminds him and actually prompts him through each sale - sales he would have lost if he ne glected to tell his customer: about the current specials. As sales representatives

go through their routes they enter data on each sale and return, so their sales and inventory records are always up to date. The Norand unit manages their cash checks and expense items including gas and oil, as well as monunous mileage and keeping track of the date and route number

In addition, it interfaces with the small 108P van-mount ed Norand printer that the drivers keep in their trucks to create invoices, which they can deliver at the time of sale

This not only saves namerwork back at the office "Rver son says. That it helps avoid questions about possible errors. since the customer can check the myonce against his delivery im Mother's Cake & mediately. Cookse has a disaster plan for manual stryoice preparation, be cause the units do fail periodical "But our failure rate is mini

Rverson reports Regroom says the Route Com mander's biggest advantage is the smage of professionalism it provides to his company's sales representatives "It imparts a certain 'automated trust, " he but an invaluable one." He adds company's savines since point

Nurand unit in terms of efficien cy rather than in dollars. In the field, we've increases

our sales without having to add additional salespeople, since



unit . . . prompts la salesmanl through sales he would have lost if he neglected to tell customers about current specials.

HAND-HELD

CEORGE DVEDSON MOTHER'SCAKE & COOKIE CO

each salesperson can now cover a wider route in the same amount of time." he says Mnther's Cake & Cookie cur

ntly has 300 Norand units in the field, and Ryerson says it ex pects to install an additional 100 during the next year. Ryerson says Mother's Cake & Cooks started to use the units three years ago, after selecting Norand because it best matched the firm's requirements at the time.

"We're very pleased with it," Ryerson says, "and we're also somewhat committed to it because we invested a lot of minner in our host software." However because the company was un omfortable about being completely dependent on one ven it has since developed modular software that can be used in other units if necessary

Mother's manages communi ations with an IBM Series 1 and a hub-speed link to an IBM Sys-Meanwhile Riverson says he

at any future time

is planning to add functions that Norand units can support right now, including a bar code canability, which will streamline field aperations still further

Take me home Some of New York-based Metropolitan Life Insurance Co.'s programmers take their sobhome with them - literally While this application of portable terminals does not involve field work or hand-hold ones, the year tables remote capabilities are certainly benefiting the way New York-based Metropolitan

According to Robert Hustie tems and technology programs mers had been looing valuable time running jobs in the evening Frequently, those jobo would stop, and there was no way to re start them until the next day. As Husnagel describes it, "We ong nally got involved with [porta bles] because we needed some thing for programmers to

expedite jobs through the night. Say you run a batch rob at 5 at 10 n m. Instead of waiting on til 8 a.m., you can dial in, fix it and run it, and you save a day Add up enough of those days saved and you have a tremendous amount of productivity just on that simplistic level

Goad Investment Programmers in Metropolitan

Life's investment systems and technology department take Informer Computer Terminals Inc 's Model 207 portable terms nals home with them. The 14-th portable has a 9-in CRT display, which can show 24 lines of 80 characters each. The Model 207 emulates an IBM 3278 terminal and connects to IBM 3090 main frames running VM through an internal modem "You just take your modular telephone line and plug it in the back. It does have a memory of sorts, and you can program your password into it Husnagel explains

in order to determine wheth er his sob is running, a program mer calls in to check its status The VM overem is ser un with a combination of moderns and soft ware that functions as a security dearce. The system bancs on checks his password and calls him back if it clears: then the programmer can work in a host

Metropolitan Life went the ortable terminal route because was inexpensive "We had a bunch of programmers who could facilitate jobs and improve productivity very quickly just by turning sequentially based jobs night. And we pack these looms blest up for \$1 900." Huspagel piece of equipment to help a \$40,000-a-year programmen

Husnagel is quick to point on that while it aids productivity the portable terminal does not fulfill everybody's at-home work needs. For a programmer it's fine. For end users who do a jot of ward processary, a PL-based iterminall that emulates the 3278 on the PC side is probably a better tool.

HARDWARE NOTES.

Team claims superconductor breakthrough

A re-earch team from Bell Communications Research (Beltorre) and Rutgers University recently claimed to have made an advance in creating thin superconducting films that could be used for future generations of computers.

The technology uses commercially available basers and bulk superconductive scengounds. The experiment mayoked a compound of straum, barrain, copper and coveyen that has been used by other superconductor research teams. The Belloore and Rungers, researchers mounted the material in a vacuum and fired laser shows at the create a vapor that foreign disverse at the create a vapor that foreign disverse.

of material. The researchers channed the processthe least expensive method of making thin superconducting films. They solid tallows a relatively inexpensive vacuum station to be put together for a higher level of control, as compared with using electron beams to do the same thing and that additional savings can be achieved by using more powerful asers.

Boeing Commercial Airplane Co., a dresson of Boeing Co., has installed an Alliant Computer Systems Corp. FX/8 parallel processing ministracomputer to help design its newest commercial passenger plane. The TT, targeted to replace planes in the class of Boemp's 727. The FX/8 will smallar real-time different elements of the TT's systems, including the anotopion, high management and propulciant to the transport of the TT of the system expansion capabilities, according to Dilip Kuniar, manager of the flight simulation is bloottory at Boemp.

Digital Equipment Corp. has won a \$114 million contract to supply the U.S. Air Force with computer systems for re-

search and development work. DEC reportedly will supply the Air Force with VAX 8650 and Microvax II manacompulers and Microvax II (IAPX workstations.

er- and Microwa (IJOF) x oorfstattons. DEC is also getting sto the library business through its System Cooperative business through its System Cooperative progression with Data Research Associates, Inc. in S. Louis, a supplier of turnley computer sistems for ibraries that serves about 300 libraries in public, and Data Research's integrated software system, Atlas, includes circulation, calloging, acquiritionis, materials booking, on-line public account, sergials control, sergials control, comission of the control, sergials control, unno lasts of seri

Tandern Computers. Inc. and big. Eight public accounting and management consulting firm Coopers & Lybrand have inked a port under which the firms will umplement on-line transaction processing applications for manufacturing, Coopers & Lybrand will provide proteating and the computer of the consultance of the control of annimant of the control of annitronics, automotave, process and seriospace industries.

Timden has also been selected as prime contractor by the Royal Hong Kong Police Force for a command and control computer system. Under the \$15 million, 10-year contract. Tandem will supply a network of three Nenstop TXP systems with 15 CPUs and \$50 workstations for regional command and control froms, police stations and other offices. The first phase of the project is expected tog con-line by March 1889.

Britton Lee, Inc. has signed volume purchase agreements with NCR Corp. and Metaphor Computer Systems to taking more than \$5 million, according to David Britton, president, NCR's Data Services Division will reportedly pur chase \$2 milion worth of Britton Lee's relational data base management systems through 1988 to run with NCR 9800 mainframes in NCR's data centers of onine financial services, which are used by nore than 800 financial institutions in the U.S. Metaphor, an existing Britton Lee OEM, is set to incorporate an additional \$3 million worth of Britton Lee subsystems with its graphic workstations

Apollo Computer, Inc. and Mentor Graphics Corp. have spired a \$100 millon contract under which Mentor will use Apollo systems as hardware platforms for its Idea series of engineering worksham. The contract calls for Mentor to acquire Apollo products, including Domain Series 3000 Personal Workshations and DNS70 Turbo graphic workstations. According to Apollo, it is the largest contract

Stratus Computer, Inc. has received a multimillion dollar subcontract from GTE Government Systems Corp. The hardware vendor will reportedly supply up to \$10 million worth of its fault-toler, and continuous Processing Systems over the next 23 months, the company said. The deals part of a \$133 million contract GTE won from the U.S. Ar Force to braid an extensive commencations system a. the North American Aerospace Defense Communical Conglete of the Systems Monardon and Communication (Systems Monardon).



Exhibitions attendees and the press all agent. The existement and sales momentum are hark and growing stronger than ever! The sales resurgence shifted into More new products, more new business, more excitement and opiniums than ever before! Over the world came to meet with more than 1.200 exhibiting companies and to awend the most users. COMIDEX conference yet

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ment and will be promoted worldwide to attract even more than the ".000 foreign buyers who came in 1986. It's all shaping up now to make COMDEX/Fall 8" the most valuable event possible for manufacturers and resellers also. The verifies is in and the opport.

MICRO MARKETWORLD

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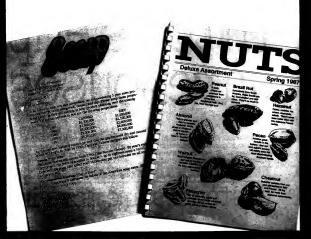
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Honeywell Bull

portant than computers.

Users rate their mainframe						
Manufacturer and Model Survey Item	Amderi	Hearywell	Henepwell	4361	18M	4300 Series.
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Tradelmooring	3 43	2 92	2 76	2 73	2 96	267
Dagelmoras en	3 19	2 80	2 68	2 66	2 90	261
Bandalbure s Bothwee	3 14	3 65	3 39	3 04	3 18	307
Oberalde System	2 04	3 52	3 37	3 13	3 127	314
Annication Processors	2 04	3 86	2 58	2 80	2 80	288

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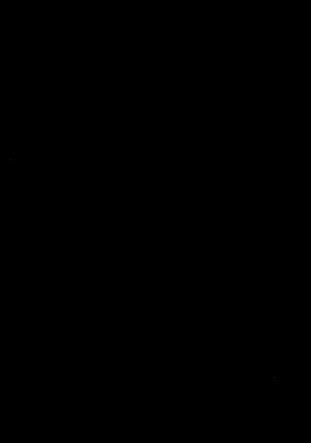
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SYSTEMS & PERIPHERALS

3090 Beries	NAS Al Models	NCR 8500/8800/8800	Uniers V Baries	A SIA'S	XIIX 10	200	A 18	Union 1100/30	1106/70	1100/90	Uniters	Other Mainframes
95 66	19 23 60	65 34 89	14 17 60	53 16 50	40 18 65	22.25	13 25	9 56 00	62 39.10	5 25 00	58 60	4) 4)
47 59 24	36 64 21 05 42 11	70 77 16 92 12 31	57 14 14 29 24 57	50 94 16 87 26 30	65 00 15 00 20 00	25 00 12 50 62 50	37 50 0 00 62 50	22 22 33 33 44 64	59 06 19 35 22 58	66 66 16 67 16 67	12 50 62 50 25 00	68 11 19 21 6 21
135 170 144	3 44 3 69 3 39	3 12 3 48 3 38	3 43 3 64 2 93	3.49 3.79 3.33	3 59 3 52 3 05	3 50 3 38 2 63	3 76 3 75 3 13	3 00 2 78 3 22	3 15 3 60 3 13	3 33 3 67 3 33	3 38 3 50 3 36	3 31
146	3 53 3 53	3 30 3 06	3 46 3 29	3 34 2 35	3 27 3 10	2 86 2 38	3 75 3 30	1 22 1 22	3 38 3 27	3 63 3 17	3 25 3 13	3 44 3 40
26 96 96	3 37 3 60 3 60	2 86 2 92 2 64	2 86 2 71 2 57	3 02 2 85 2 56	2 17 2 77 2 40	2 25 2 25 2 25	2 66 2 75 2 71	2 78 2 44 1 75	2 96 2 73 2 46	3 00 2 83 2 67	2 13 3 00 2 63	2 31 2 11 2 93
27	3 14 3 23 3 08	3 20 3 11 2 46	3 57 3 29 2 50	3 57 3 52 3 07	3 55 3 27 2 51	2 12 2 28 2 71	3 75 3 63 2 63	3 11 3 00 2 00	3 36 3 34 2 70	3 50 3 50 2 50	3 38 3 25 2 75	337
85 81 24	2 86 2 67 3 13	2 89 3 10 3 15	333 350 333	3 50 2 34 3 51	3 27 3 11 3 36	3 13 2 75 2 75	150 138 136	2 78 2 11 3 00	3 16 2 89 3 18	3 33 2 80 3 33	3 40 3 60 3 40	3 12 3 00 3 38
67	3.84	3.31	3 14	2 49	3 32	163	163	3 22	3 14	3 83	3 13	3 50
36	3 50	3.14	3 21	3.27	3 25	1 50	3 13	2.67	3 10	3 17	313	3 44
39	3 47	3.40	143	2 82	3 53	3.29	3 63	3 00	3.46	3 50	3 13	3.50
46	3 63	3.21	364	3 44	3 31	3 00	3 66	2 56	2.67	3 40	3 33	3 34
38	3 63	3.40	3 50	3.35	3 22	3 00	3 63	2 67	2.66	3 17	3 25	3 00
16	3 32	2.95	3 35	3 54	3.25	3 00	3.88	2.67	2.81	3 17	3 00	2 63
65	2.76	2.56	2.75	3.00	2 95	2 50	3 00	- 78	2.76	2.43	2 25	2 53
97	3 06	2.45	2.67	2.99	2.75	2 50	3 00	149	2.74	2 63	2.75	2.75
79	3 26	2.09	3 50	3 06	3 06	2 88	136	2 44	2 70	3.17	3 25	3 13
76 35 35	94.74 0.00 5.26	92 31 1 54 6 15	100.00	96 23 0 00 3 77	95 00 0 00 5 00	100 00	100 00	-00 00 0 00 0 00	96.27 1.61 1.61	100 00	100 00 0 00 0 00	0.00
12	94.74 0.00 5.26	61 54 10 77 7 89	92 66 0 00 7 14	94.34 0.00 5.66	92 50 2 50 5 00	100 00	100.00	08 69 0 00	90.32 1.61 8.06	100 00	100.00	67 50 12 50 0 00

99



Top system

firm, said users rated 1.28 mainframes on questionnaires as user-satisfaction survey satisfaction scores showed I'mtoys on top at 3.239, followed by National Advanced Systems Corp. (NAS) at 3.205. Amdahl at 3.202, IBM at 3.169, Honeywell Bull at 3.14 and NCR Corp. at

Datapro analyst Marilyn noted that the Honeywell Bull DPS 7 scored better this year than it had in the past.

Datapro survey winners Highest ranking systems

System	Overali satisfaction	Lowest	Number of responses
Honeywell DPS 7	3.59	2.80	40
IBM 3090	3.24	281	85
Amdahl 580	3 21	2.85	29

climbing from a 3.3 overall satis faction rating to a 3.59 rating for the highest overall score among systems mentioned by 20 or more users. The DPS 7 also scored well in ease of operation (3.59), reliability of the mainframe (3.72) and operating sys-

tem(3.65)

Honeywell Bull, with a lead ing corporate satisfaction score of 3.38 did not fair as well with its DPS 8, at 3.16, or DPS 88 and DPS 90 high-end machines, which received fewer than the minimum five responses needed

Special merit systems ited these high in certain awas

Ease of operation	Wrighted average	Number of responses
Amdahl 580	3.62	29
Honeywell DPS 7 Unsys A 9/A 10	3.59 3.59	40
Religibility of mainframe		
IBM 4381 IBM 3080 series	3 84 3.79	335 233

such as ease of operation (3.62). reliability of the mainframe ... 72) and services such as maintenance, technical support, education and documentation. Am-Amdahl scored well in areas dahl also led the field in user

recommendations, 97% of its us ers said they would recommend mdahl systems to other users NAS finished second in that cate gory and scored well in other areas but fell short of the 20-response minimum for special mention and finished last in over-

Users rate their mainframe vendors

for tabulation.

Manufacturer and Model	Amdehi	Heneywell	100	NAS	NCA	Unisys	Other Maintenner
as of the flavores	,,	78	866	19		208	18
to of User Responses warese Life of System (months)	18.79	37 53	26 37	25 68	34 85	27 24	43 40
equation Method (%)		62.02	48 54	26.64	70.77	6140	68.75
Purchase Renal or Lease from Manufacturer	65 52 17 24	19 23	12.06	21.05	18 12	19 23	18 75
Lease from Tried Party	17 24	17.95	35 91	42 11	12 31	27 88	6 25
ovstern Ratings (4.0.1.0)							
Ease of Operation	3 82	3.46	3 20	3 44	3 12	3 36	3 39
Reliables of Marchania	3 72	3 64	3 79	3 89	3 46	3 16	3 38
Religibity of Peophesis Marutacruse s Mancenance Service	334	720					
Beggerwaeness	3 66	3 44	3 22	3 53	3 20	3 35	3 44
Effectivement	3 50	3 29	3 39	3 63	3 06	3 22	3 40
Manufacturer's Technical Support		3.17	3.07	3 37	7.04	2.94	1 38
Troubleshooping Fourance	3.41	2 65	291	3 37	2 92	2.75	3 19
Documentation	3 18	2.74	2 85	3 00	2 64	2.46	2 83
Manufacturer s Software							
Charratma System	3 14	3 53	3 17	3 14	3 20	3 46	3 31
Compilers & Assemblers Applications Programs	3 D4	3 45	2 96	3 23	2 46	2 72	2.57
						1 19	212
Ease of Programming Face of Convention	2 95	3 26 3 07	2 69	2 66	2 80	3.06	3 00
Ease of Convention Overall Sensitions	3 21	3 38	3 19	3 13	3 15	3 30	3 38
Addresse Repose i 0 1 0s		-					
Tyreiness of Herbert Histolianon	3 72	3 5 3	3 53	3 64	931	3 33	3 50
Timeleass of Subware Installation	3.46	2 29	3 19	3 50	3 14	3 18	3 44
Fase of Essention	3 55	344	3 17	2.47	3 40	3 53	3 50
Communition of Hardware Carnel Over from Other	349	314	3 21	3 63	3.21	3 17	3 38
Systems		1					
Companishing of Programs-Spaa Carried Over from Other Spacets.	3 45	3 18	3 13	3 63	3 40	3 10	3 00
Power/Energy Efficiency	3 24	3 23	3 12	332	2 86	3 19	2 63
Productivity Ards Help Keep Programming Costs Low	2.71	281	2 82	2.75	2 66	2.79	2 53
Software Support Delivaried by Vendor	3 07	2.96	2 86	3 06	2 46	2.73	2 78
Keaping Up with & Implementing Vendor Changes to Hardware/Software (Very Zesy 4.0 Very Difficult 1.0)	3 19	3 16	2 75	3 26	3 09	2 97	3 13
Did the system do what you expected it to do? (N)			95.02	94.74	92 31	67.12	100 00
Yes	96.56	93 59 3 85	95 03	94 74	154	0.48	0.00
No Under dell	000	2 56	254	5 26	6 15	2 40	0.00
Would you recommend system to snother user? (%)					8154	93.27	87 50
Yes	96 15	84 F2 7 68	173	94 74	10.77	0.96	12 50
No Undecided	000	7 69	2.89	5 28	7.89	6.77	0.00
	1.00		1				
	1		l			1	

all satisfaction at 3-13. Unisys systems and the corporation as a whole posted the hughest scores or used for the highest in 17 categories, with the high-end A 15 mainframe used by eight respondents, lead mg 10 of those categories On the negative side. Unisys had the lowest scores in 21 areas, with the nine users of the Unisa-1100/60 and eight users of the Unisys B7900 combining to pro

vide 18 low ratings Users of NCR equipment gave that company some of the lowest corporate ratings includ ing those for ease of operation reliability of the mainframe and

However, Courtney noted that the NCR systems rated were some of the company's old er systems, the 8500, 8600 and 8800 The NCR 9800 introdoord but year was not men tioned by users

The poorly rated Unisys 1100/60 was the oldest single system, with an average life of

Trend in buying pattern Datapro detected a trend in the pattern of system acquisition only 52% of the respondents said they own their computers, compared with 54% in 1986 and 56% in 1985. The number of users leasing systems from the monufacturer inched unward from 14% to 15%, while 32% of

the users said they lease systems from third parties. Courtney also reported that

main memories continued to increase in the mainfranc market The number of systems with more than 64M bytes of memory rose from 5% in 1986 to 7% this year. A total of 49% had at least 16M bytes of memory this year lust three years ago, the major ity of users had between 2M and 8M bytes of memory, and only 2th had more than 32M bytes

Datanto also found the num her of terminals connected to mainframes increasing, with 53% of the systems supporting more than 60 local terminals and

46% supporting more than 60 remote terminals Last year Continued on page 66

IBM CPU field

(IBM's) accounts, we believe IBM will

have rough sledding," the report says The study surveyed 271 MIS executives managing IBM mainframe installatues. Their companies were in the bank ing finance insurance and manufacturing ing from small businesses to Fortune 500 companies, in roughly equal proportions

of small, medium and large firms. Currently, DEC with 16.7%, is the only non-IBM vendor with a significant presence in departmental systems. The communes that have DEC equipment in a department do not have IBM mid-range too, the study found. However, when DEC equipment is present, it is generally found with other non-IBM processors, such as those from Wang Laboratones Inc. Hewlett-Packard Co. Data General Corp., Tandem Computers, Inc.

and Toyar Instruments Inc. With the IBM 9370 departmental processor waning in the wings, the stage is for a showdown between the IBM 9370 and other minicomputers in the departmental arena. Gruhn predicted the 9370 will tend to retard DEC's progress as customers delay decisions in order to

examine the new machines The study found that 32.4% of IBM accounts surveyed had no departmental sy ems but had a clear demand for them. As a result, the mid-range rivalry among companies seeking to sell to these ac ounts should continue for the next sever-

I think IBM is going to do quite well with the 9370." Gruhn said. "IBM says 73% of 9370s are being targeted to new applications. If the 9370 does these jobs well, then DEC will have a light nn its

"she added But the degree of the 9370's success will determine whether or not IRM can have its traditional clear majority market

share in departments that it now has in other markets. We won't know if IBM can pull it off for six months." Gruhn said.

Top system CONTINUED FROM PAGE 65

50 × supported 60 local terminals, and

45 is supported 60 remote users ned an alternating nattern in connection with their expansion plans for this year Expansion to current hardware configurations, indicated by 63% of users, surpassed expansion of data communications facilities, named by 62%, to head the list for 1987 acquisitions

from 53% to 50%.

ommunications expansion had moved shead of hardware growth last year Sharp drops showed up in connection

with software needs as acquisition plans for proprietary software shipped from 62% in 1986 to 55% this year. Acquistion of software from manufacturers fell

However, one growth area was laser primer acquisition. Plans for those ponimpact printers were cited by 28% of the users this year and 26% last year, which was the first time they were included in the

EMC ships VAX boards based on 1M-bit chip

cently claimed to be the first company to ship high-end Digital Egippment Corp. VAX memory boards using 1M-bit random-access memory (RAM) technology

with the delivery of its 16M-byte memory arrays at several customer sites EMC officials said the 1M-bit technolgy allows increased reliability and avoids

the downtime associated with backplane

mory boards requires no modification of the VAX backplane EMC Senior Product Manager Keyin Fitzgerald claimed the 1M-bit technology

used in upgrades based on 256K-bit tech nology. He also claimed EMC upgrades cost 20% less than comparable DEC up grades

FMC s 16M-byte module costs A 32M-byte upgrade costs

ory arrays for DEC VAXs The firm also announced it has begun de velopment of memory arrays for DEC's low-end VAX 8200, 8250, 8300 and

8350 computers. The memory arrays will be among the first compatible-memory products that

incorporate a VAXBI interface developed

8M-, 16M- and 24M-byte boards, be fully compatible with the VAXBI architecture

and use 1M-bit RAM technology, the ven EMC claimed its boards will run 20% faster than DEC memory boards. The EMC memory will deliver instructions and data from the CPU 2 300 usec faster

than DEC's memory, the vendor said. The low-end 8000 series VAXBI memry arrays will be available this month EMC said.

The better you understand the better your company c

The MIS perspective.

has received scant attention from MIS. Which is strange, considering how stal it is to some of the key people MIS has to seems Like the CEO plotting global com-

stative strategy For planners, strategists, and sens marketing executives, text manage ment systems have proved their value repeatedly in recent years-delive propertial horton line hanefits, and creating a wave of demand that's headed night for you

Here do you prepare for this de mand? Several ways First, make sure you understand text management software—before your users do. (Hint, we're not talking

Second, select a text management approach that combines the features. with the features you'll need to main tain system integrity. Users need spe cialized text search and n facilities convenience) DBMS's don't offer; you need a new level of sastem s dedicated retrieval systems

And third, start evaluating test without delay. You can bette that

INGUIRE/Text-the most compre hensive, proven text management software system on the market

Text management: It's not word processis And it's not data

Teachtonal composite reformation externs do a great inh managing formation most needed by decision makers is often unstructured-vernheid ded in the text of documents such as letters, reports, and contracts. Because this material has traditionally been beyond the reach of online systems, access to it has been slow, tedious and emor-prone. Word processors and office automation systems, for all their other ments, have been practically useless in making the actual informa non content of documents available

A test management portion fills this old by providing highly sophisticates facilities for online index, search, and ments. With a text management sys. tem, users can propornt specific prece instantly. And once they've found the information, they can edit combine, and report it with complete

Traditionally, the buggest text man serment users have been in industries that are subject to extensive regulation and/or frequent Bigation. Now others are taking advantage of the systems canabilities for a broad range of corpo And high on the list of these tasks is

compensive sitelligence gathering for or management The result has been a dramatic improvement in the quality of infornon available to decision-makers And a dramatic increase in pressure

on MIS to deliver text management INQUIRE/Tex The features users no The control you ne

As the demand for text managem capability has grown, so has the number of vendors claiming to provide. But few of these vendors offer the features, the flexibility, and the track record of Infodata's INOURE/Text. INCIUIRE/Text's automatic index removal facilities have set industry years. And INQUIRE/Text's capacity ease of use, and flexible interfacing options have made it a bit not only

sonnel charged with implementing it Finally, INQUIRE/Text's worldwide track record makes it comfortable to top management.
INQUIRE/Text, It's the first thing ment. And the only text management software system you'll want to live

Genicom obtains marketing rights to PDL

Plans to incorporate ACE technology in line of printers, OEM products

BY PETER BARTOLIK

ATLANTA — Although the desktop pubthing market is rapidly coalescing around a page-description language (PDL) standard, Genicom Corp. is betting that a brooder market will enthrace as alternate PDL.

The printer manufacturer announced during Comdex/Spring '87 that it has obtamed the marketing rights to raster im-

age processing technology and the ACE

PDL from Chelgraph Ltd. in England.

Genicom said it intends to announce printers and OEM products containing the technologies by this fall and begin to ship products in early 1988

Heading toward faster output Adobe Systems, Inc.'s Postscript PDL

has gained widespread endorsement among vendors of desktop publishing products but Gentom officials said the market will develop rapidly for a PDL that they claim is invisible to the user and will enable laser printers to output at a much

According to Rob Auster, director of marketing for monimpact technologies with Genicom. ACE was designed to automatically convert to printer output the page layouts designed within end-user applications, whereas Postscript was de-

plications, whereas Postscript was designed to build a layout outside of the application.

During a demonstration held outside

the Condex show, Auster demonstrated the output of several dozen graphics, many of which were complicated, and none of which required more than a few seconds to execute. Ausier claimed increased demand for faster output laser may hines is a result of the time lag required by printers to out

put complicated graphics.

"When you have 8 page min printerthat really print at 8 page min, there is

he said

Gencom obtained the technology rights for plain paper products while Chelgraph retained the rights for the linoting market.

Apply to printer products Genecom said it will use the technology in a full line of printer products and will make

it available to OEM firms on a board basis or through license The company is writing drivers for certain Microsoft Corp. products, includ-

ing Windows, the Apple Computer. In: Macintosh Inter: Digital Research. In: SeEM products: as well as Unix and mainframe applications.

While he said he expects Postscript to retain the loyalty of graphics artists while create their own layouts. Auster said

retain the loyalty of graphics artists who create their own layouts. Auster said Genicom expects a broad market acceptance of an alternative that allows users to simply use the layout capabilities of their applications and obtain almost instantaneous outsul.

Auster said the Gencom products will be priced from 20% and 40% lower than printers using Postscript and claimed they will provide from two to 10 times greater productivity.

text management software, an handle the competition.

The corporate strategist's perspective.

The amount of information that must be between into major corporate decisions is increasing every day. And few casegories of information are as sen sithe or time-critical as competitive in

braggeric. Whatever its source, whatever its source, on petitive information can be trial one day—and virtuality when the best in the man. To be used successibly in the timing and execution of any must be fold secretal and action must be both secreta and action must be both secreta and action able—and exhibits to you shead of your conjugation, and there's no be turn are information into extraorback institution; and there's no be accomback to the time way to turn raw information into extending online system under INGUIRE/TEX.

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Competitive tillormation comes from many internal and external sources; correspondince and nemons, articles in stode gournals, press reissaes, finan als reports, assimilating this information and making sense of it in time to act requires supplicational text manage ment capability. And INCHIES/TEXT provides that capability. And INCHIES/TEXT provides that capability in a provider shat capability in a province shat capability in a province shat capability in a province shat meets the meets of component strategate as well

With INGUIRE/Text, the full range of appropriate internal and external in formation (in both text and alpha numeric forms] can be maintained online. Document searches can be conducted quickly and accurately, and people can share integrated, relevant information instantaneously—speed ing decisions while minimizing poom tall errors due to faulty or incomplete.

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A system that pays dividends for many departments including MIS. For all its socialistication, INOURE/Test

For all its soprassication, involunce of its easy for non DP-oriented users to master. Which makes it especially powerful as a means of presenting, strategic information to top manage

But these managers aren't the only ones who benefit from INCLINEZ/Text. Marry of the features that make INCLINEZ/Text such a supernor business unfeligence tool also lend themselves to other uses in legal departments, regulatory affairs, market ung, the lathray—and not least of all, MIS lead?

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High-speed race

to the transfer of the above accounts in our paper between the above accounts in our patterns as it railists as internetted in travel. But the appearance of unable superconductor creats could occur within three years, according to industry observers of progress, continues as quickly as industed by the claims made in organizations such as Bell Communications. Research Bell Bill and their rival for researchers at IRM and their rival for researchers at IRM and their rival for researchers. ALT argonne National Laborators and Oak Rogley Stational Laborators and Oak Rogley Stational Laborators.

It should be noted that the first circuits are likely to be special-purpose circuits — designed to reduce key bottle necks — that can be easified and supercooled to support the high-speed switching that supercooled to support the high-speed switching that supercooled cross are interfect to provide. Also, it is unlikely anyone will want to build an entire supercooled, supercooled, supercooled-superco

In addition, it should be remembered that plenty of roadblocks remain for the researchers. For example, most of the recent announcements — such as the claim by Bellicore and Rutgers that they have used commercial lasers to construct thin film superconductors — are forcused on making, not using, superconduc-

tors.

But there is enough happening in the field to justify. MIS managers taking note and recognizing that a new technology could have an impact on their jobs within a few years, or at least within the next de-

cade, which isn't a long time in career terms Conoch a Computerwood's sense editor

NEW PRODUCTS

Pracessars

tutoscan32 a ramb of angle-slot FO strollers supporting Multibus I and VME bus system expansion, has been annotate of he Ariel Systems. Inc.

Autowan 32 teatures a 24-MHz ma roprocessor, support for up to 32 asynchro-2005 channels, 64K bytes of random ac ess memory and up to 19K bytes of readols menors. As a modular controller, it upports eight channels at 38 4K bit/sec 16 channels at 19 2K htt/sec. and 24 or 32 hannels at 8.6K bettee. Each channel is is beindependently configured.

The Autoscan32 for the Multibus I osts \$3,595. For the VMEbus, the prod-

Ariel Systems, Suite 1, 8545 Arions Drive, San Diego, Calif. 92126.

Data starage The DO686, a disk drive controller sad

to connect up to four disk drives to Q-bus computer systems using the enhanced anal) disk interface (ESDI), has been an noun, edby Distributed Logic Corp The guid-height o un to four 5-1-in. ESDI Winchester disk drives with data transfer rates of up to

1.9M byte/sec... the vendor said. Support for the ESDI interface standard includesupport of parameter-passing commands and use of disk drive manufacturers; flaw maps during drive formatting. It is also contratable with mass storage communications protocol drivers.

The DQ686 costs \$1.650. Distributed Logs, P.O. Box 6270, 1555 S. Sinclair St., Anahem. Calif.

has announced a nonvolatile bubble-metri ory module for Digital Equipment Corp

Buddt Board

As many as 16 QBH-11 Bubbl-Boards can be operated in conjunction with one controller, providing up to 16M bytes of on-line storage capacit

untrities of 10. Bubbl-Tec, 6805 Sierra Court, Dublin,

The 95 tO industrial har code termi nal and the 9550 industrial bar code transaction manager have been intro duced by Intermec Corp. Both products feature 32-char LCD

Both can be used with various scanning devices, according to the vendor Standard interfaces include RS-232C and RS 422 Data can be transferred at 19.2K bit/

Intermed's Interactive Reader Language programming language. It is said to allow the user to follow transaction sequences collect and format data and transmit transactions to the host computer Its memory is expandable to 64K bytes

With display and ward powerpack, the 9540 costs \$1,095; the 9550; \$1,345. Intermec, P.O. Box 360602, 4405 Russell Road, Lynnwood, Wash 98046

The HG-6905BK a 19V, 20-in high line-rate color monitor with analog input has been announced by Mitsubishi Electronics America, Inc.'s computer

peripherals division. The monitor is said to feature a scan range from 40 to 67 kHz horizontally and 50 to 75 kHz vertically. It offers a 1,280-1.024-pixel noninterlaced-resolution CRT with a self-convergence in-line gun, 0.31 mm dot pitch and a 90-degree deflection angle

The HG-6905BK is priced at \$3,750 Mitsubishi Electronics America, 991 Knox St., Torrance, Calif. 90502.

Printers/Platters

Zvert Corp. has unveiled the Emushare-860, a dual channel emulator designed to connect up to two Xerox Corp. Model 860 word processors to the Xerox Model 4045 laser printer.

The Emushare-860 comes with two ets that are said to match the prop etary interface characteristics of the 860 word processor It supports the features of the Xerox

860, including bolding, super and subscripting, forward and reverse indexing, variable-line spacing, overstriking, un derlining, justification and decimal abgn-The Emushare-860 is priced at \$970.

A ZIO upgrade, said to increase the 860 word processor's print speed from 40 to 400 char./sec., costs \$420. Zvert, 15234 Transistor Lane, Huntington Beach, Calif. 92649

Calcomp has announced price reductions for its 5800 series color electrostatic plotting systems. Models 5825, 5835 and 5845, which commodate media widths of 24, 36 and inches, respectively, now cost \$49,000, \$59,000 and \$69,000, respec-

tively. The 5800 series offers standard vector memory of 12M bytes, with 25M-50M-, 140M- and 280M-byte disks avail able, the vendor said Calcomp, 2411 W. La Palma Ave.. Anshern, Calif. 92801.

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was MULTICAM, the information system you build can be more cauch, more complete, and more reliable—and be delivered on time and within budget.

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Features include a command-queue buffer, a 28-sector data buffer and sup-

port for 16- 18- and 22-bit Q-bus ad-

The Bubbl-Tec division of PC/M, In-

microcomputers called the QBH-11

The half-height O-hus printed-circuit board is said to provide 1M byte of mass storage. It consists of two 4M-byte bubble devices plus support circuitry and can dard Q-bus bubble memory controlers, all of which emulate standard DEC disk

The QBH-11 is priced at \$1.409 in

Terminals

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What did IBM buy for \$22 billion?

An investment in manufacturing yields robots, mobots and a few idle production lines

BY MICHAEL SULLIVAN-TRAINOR

self-powered car operating on an overhead monorail quictly delivers circuit-board panels IBM's Lexington, Ky., plant. The arrival of the circuit boards activates the station, which moves the boards through the queue to 51 waiting assembly ma-

> The process is controlled by IBM Series/1 computers - local controllers at the machine level and a large, fully configured "module master" overseeing the entire board line. Unless something goes wrong, the line operates almost completely without human intervention, producing 50 different types of logic cards for personal computers, printers and typewriters.

> Meanwhile, on the factory floor below, robots, inserters and wave-solder machines surround a surface-mount machine Using the new surface-mount technology, which incorporates a proprietary IBM design, IBM creates double-sided boards for the Personal System/2 that inas one-third to one-half of that of traditional me-insertion boards. More circuits take up less space when installed this way in the PS/2, and signals travel more quickly between components. During the past five years

> IBM invested more than \$22 bilhon in its 39 plants, equipment and property - \$350 million to upgrade the Lexington facility alone. The investment is equiva-

Salivan-Transor is a Computerworld sergor writer (Photos courtray of IBM) lent to 80% of Digital Equipment Corp.'s total revenue for the same period But what did IBM buy for \$22

A long-term strategy
"IBM has developed a competitive edge in manufacturing." says Stephen Rosenthal, profes-

sor of operations management at Boston University. "They have a very long-term perspective that certainly re-

quires having a lot of internal re-sources to invest." Rosenthal continues. "But a lot of companies that have the resources are not investing as much in manufacturing as IBM is, and I think, markets it pursues. Five percent

over the long haul, it's going to to 10% of the manufacturing in be a valuable tool for IBM IBM invests so much money m manufacturing because it

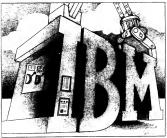
must meet a complex set of rein the market, according to Heinz Fridrich, IBM's director of manufacturing. First, IBM's goal is to be the

technology leader, producing innovative, proprietary products... The hon's share of the investment is devoted to developing its meet product requirements. A second goal of the commany is to be the low-cost producer of products within each of the many

vestment is devoted to improv ing productivity through automation. Fridrich says

Frequently, the first goal con quirements to stay competitive. flicts with the second because it requires spending more money while the second goal focuses on saving money. Despite IBM s er, its manufacturing arm has lit sive tools to build products technologies so that you can do your development. That is what really drives investment. Fri

> As a result. Findrich's manage ers try to save money in other





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ways. A prime example is their philosophy Continuous Flow Manufacturing (CFM), IBM's version of the Japanese Just-In-Time concept, which requires workers to maintain a continuous flow of products on the lines, greatly reducing work in process and inventory and, at the same time, speeding production.

IBM's manufacturing managers must also be able to respond quickly to product demand. During the last five years, these managers geared their plants to produce high volumes in order to meet market forecasts. Today, the forecasts have proven to be overly optimistic, and many plants are not utilized to their maximum

To deal with capacity problems, IBM practices work-load balancing, shifting products between plants. Such a strategy requires a great deal of flexibility. Investments in automation - particularly programmable robotics - make this balanc-

ing act possible. Another way IBM meets its manufac



turing goals is to rely heavily on in-house production. Cost, quality and proprietary technology are easier to control when the participation of outside vendors is kept to

"If it's a standard chip, and there's no proprietary advantage in making it inside, IBM usually won't," independent consul-tant Ulric Weil says, "But if it's specialized, they'll make it themselves. They are more wiling to put money on the table to huild in-house, even if they could get just as good a component on the outside." SAVE a. To further support the canability of de

veloping products in-house, IBM uses a portion of its manufacturing resources to educate managers in new processes that give IBM a market edge. We teach things that are not general-

ly known - techniques for measure ment, surface preparation, a whole range of process canabilities," says Sam Korin director of IBM's Manufacturing Technical Education Center in Thornwood, N.Y (see story page 80).

At the high end The crown lewels of the IBM manufactur-

ing empire rest in the heart of New York's Hudson River Valley, where seven plants make everything from semiconductors to printers. A short distance from the Ar monk, N.Y., corporate headquarters and the Thornwood education center, three of IBM's most sophisticated facilities em ploy some 30,000 people to build the company's high-end machines - 3090s. 3080s and 4381s.

MPHASIS on quality extends to the most basic level silicon crystals. Crystal ingots are pulled from molten silicon, which is melted at temperatures approaching one-quarter the heat on the surface of the sun.

Fishkill, NY., to its assembly and testing in Poughkeepsie and Kingston, N.Y., the mun components of the 3090 system travel fewer than 30 miles between plants

before they are shipped to the customer. To assemble these components, other parts are required from IBM plants in Endicott and Brooklyn, N.Y., Burlington, Vt.: Austin, Texas: Tucson, Ariz.; San

From its birth at chip level in East Jose, Calif.: Raleigh and Charlotte, N.C. Montpellier, France; Hannover, West Germany; and Yasu, Japan.

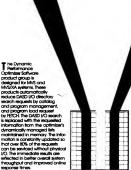
Advanced manufacturing processes are the hallmark of the 3090's development. Because complex, proprietary cesses are required and because of IBM's desire to ensure top quality and reliability. great pains are taken to develop most of the components within the corporation

This emphasis on quality extends to the most basic level - silicon crystalproduced in East Fishkill Crystal ingots are painstakingly pulled from molten silcon, which is melted at temperatures approaching one-quarter the heat on the surface of the sun. The ingots are smoothed into cylinders and then sliced to form wafers. Logic and memory chips are eventually diced from the wafers

To accelerate chip production, IBM uses "master-slice technology," requires a predefined circuit pattern to be repeated on silicon wafers. Many arrays of identical circuit-element cells are produced as a result, allowing designers to add new circuitry to customize chip varia

Designers trace intricate circ





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IBM spares no expense

IRM has shout approximately 10% of its total revenue - more than \$22 billion - during the last five years on land, buildings machiners and equitment, with the mannets of the superiment going to manufacturing improvements



natterns using either IBM-de surred electron-besin lithographs: or standard photolithic graphs muchines. Most other emiconductor manufacturers use the photolithography meth ed, an which optical light interacts with chemical film to gener ate a nattern

But the faster electron-beam lithography uses narrow beams of electrons to interact with the film. IBM - machines can inter onnect circuits on up to 2,000 chips per hour

In addition to the clara, the East Fishkill plant manufactures substrates - chin carners that are at the core of the 3090's thermal conduction modules Containing up to 36 peramic lay ers and more than 130 meters of integrated winny, the substrates are made from a cerange sturry. IBM mixes the sturry from raw materials and water in a grant vat. Eventually, it is oven dried and cut into 185mm sheets, which are stacked to form the substrate. Each sheet contains wires that, laid one on top of the next in the stack, form the circuitry that interconnects

Camplex redesign To accomplish these proces IBM redesigned the East Fishkill plant, completing a 153,000-sqft test facility in 1984 and a new

senuconductor building in 1985. Among the more elaborate mea uses in the plant design are acnation and dust. Class 100 air is purposed continuously through the chin-fabrication rooms. To prevent vibration, manufactur ing is restricted to the middle floor of the plant, which is supported independently of the tun and bottom floors. Those floors use the air-flow equipment Both the increased cost of

equipment and the complexity of the technology make semicon

· No system or JES mods

ductor manufacturing one of the most expensive processes at

Thirty years ago when we built 1.000 wafers, it cost \$3 mil-lion to \$4 million. 'Fridrich says Now, for 1,000 wafers, the tooling alone is probably a couple of hundred stillion. We've in creased from decade to decade

by almost an order of magni-For example, a photolithogra phy tool years agn created patterns at a width of five microns Fridrich says, Today, because of a technological breakthrough by IBM. the tool works in half-nem

crop line width to achieve the density of current sensconduc-"Each time you change the width, you need a different ma-Fridrich declares Years ago the tool cost \$100.000. Today, you cannot even touch one under \$1 mil

ments are neces sary for IBM to Boston Universi Rosenthal "In the good old days, IRM was in control of the indus try and they

could pretty pace and the di Now there are many more play ers, and the tech pology is shifting more rapidly. They have to be able to move at a

New circuits are produced by the East Fishkill factory in 18 days, compared with at least six weeks' production time required by other semiconductor manu-

Hasts arder parts After they leave East Fishkill the chins and substrates are sent to Poughkeepsie where they are modules (TCM). The modules are mounted on raw TCM boards constructed in Endoor First introduced as part of IBM's 3081, the TCMs are used to cool the mainframe's logic and array

A data system based on two 3090 hosts and several Series/Ls controls the assembly and test or Proghkeepsie's entire TCM operation. When an order is recurved from sales, the data sextem checks the inventory, both on the production lines and in the warehouse. To meet the order's requirements, the system will automatically place an order with other IBM plants and outside suppliers, which send the needed materials along with no mencal control data describing the history of each part.

Data about defects in each clim, substrate and board is made into a composite with data from engineering laboratories regarding change orders for the modules. The data is communi

cated from the bost to Series/1 systems, which run the tools that assemble and test the modules "The classic manufacturing problem is that you build a lot of units belore the engineering change order takes hold," says Glen Allmendinger, president of Harbor Research, Inc., a Boston

based manufacturing consulting By putting the orders on lose TRM is distributing that data in a highly timely fashion. When an engineer finds something wrong with a product, the data system feeds the mistake back far faster than your average electronics manufacturer." All-

A floor control system, also run by the host data system,

ation of the last

wires on a 3030 thermal conduction module board

manages the flow of products

through the lines by maintaining

a sort of inventory book that

shows where all the parts are

and what stations are available

For example, an operator may

find defects in a module and inpu

the data into a Senes/1 control-

ing the inspection process. The

Series/I will then query the host

as to where to send the board

The host will communicate a se-

nes of stans that the Senas /1

must follow to route the board to

Another function of the host

systems is to maintain a data

bank of what is happening on the

lines so that operators and man

agers can trace trends and more

On the bottom floor of Building

004 at the sprawling Pough

keepsie site, the data system be-

gins assembly of the TCMs. Chip

sets from Fast Fishkoll are placed

in bins according to order num

bers. An operator activates an

automatic "picker" that selects

chips from the inventory bins to

create a specified strip of chips to

The substrates are manned

build a particular module

the proper rework station with

out operator intervention.

tor production

By the numbers

aggg

name a tool specials designed for the purpose. The mapper controls the placement of engineering change orders and sets the unique features of the chip sites. As the modules go through subsequent operations, the Series/1s on the line refer back to the data recorded by the mapper

to determine the correct loca tion of the chips for each module Following mapping, a Series/1-guided laser modifies the substrate thip pads by deleting connections to accommodate de

fects and engineering changes. The chips are aligned and placed on the substrates by a tool image of the chins and integrates strate surface. The machine stops at every 10th chip to allow an operator setting at a terminal to check its work Prior to the installation of the

IBM-designed automatic align ment machine Alcorn, operators used a joystick to

align the chips while the 1112 performed placement Alcore works at a great er speed and with accuracy

than an operator After the chips are placed, they are bonded to the substrate mark. solder in a reflow furnace that makes all the conpections - more than 100 ner 3090 module

A discrete auto bander ultrasonically connects copper multaneously Wire bonding be-

tween the chip pads is done at tras-inically with copper wire using a discrete auto bonder (DAB), which resembles a sew ing machine when it operates During the process, the high-fre ultrasonic vibration buries the gold plate of the wire into the gold plate of the chip pad. The DAB obtains the bond ing coordinates from a Senes/1 Operators are stationed at the the process IBM continues to use ultra-

sonic bonding - a mid-1970s technology - rather than a faster technique of microwelding used by other manufacturers. because there is no way to control the temperature changes in the chip pads at different levels of the substrate, says Frank De Turns, manager of the TCM Unpredictable

changes in temperature can af fect the rehability of the chip connections. The major test in the process is performed by the Poughkeeping Accelerated Pur-In System, or PARIS, which subsects the modules to varying power and temperature cycles to drive the chips to fail in the equivalent of six hours of opera turn Any futures are cost to



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the East Fishkill plant by the host, and the reason for the problem is investigated.

When vistors tour the Poughkeepsie plant, they are taken to Building 012, where the TCMs are mounted on boards in an automated production line. While the entire operation is computer controlled, there are

certain key areas in which IBM found there are things people and bar code readers are sta tioned at spurs along the rollercan do better than automated debearing track so computers at

At the beginning of the line, a robot stands idle in the center of a room filled with manned workstations. There, operators insert 20,000 C-springs - in strips of 1.000 - into each TCM board with a sharp click. The springs connect the TCM modules to the

materials-handling system. Adn't save anothing by nothing board We did attempt a robotic the automated handling system program on this, but we couldn't in place in terms of overhead, because we created other jobs for imitate the operators' hand-eye coordination," De Turris says. operators to run machines on the When IBM first considered DeTurns says. "But we hne." automating the line, it took an did save 10- to 20-min, segments operator eight hours to complete of an operator's job when they

HE 3090 module and

advanced board lines

FRANK DETURRIS

IRM POLICHKEEPSIE

are pretty much

exclusively built in-house because of the technology."

the insertions. Now, because of

efficiencies that reduced the

amount of work in process, the

operator takes less than four

the boards on through a wayn-

solder machine that fills the C-

spring holes with flux. The

boards are then X-rayed and in-

spected by operators to make

tomated board line in Pough-

keepsie in 1985, the 3090 boards were built in separate ar-

eas, or "pockets of production, and operators wheeled them

around on carts. Manual board

handling required extra opera-

tors to be available - idle - to

sure all the holes are filled

Move merchandise

After the C-spring insertion.

hours to finish the job

system IBM says it is proud of this

> were looking Kathy Corey, one of operators helped implement the board-handling system, now controls a sector where several opera

tors work with the boards as they are delivered by the cars. "Operators used to nick out the boards they felt it would be easier to work with leaving other boards sit." she says. Now we have control of distributing the work on a priority basis

Assembly robots In the final board as sembly, robots install capacitors and bond them by using a hot gas tool to liquify the solder. Manual tools sit side-by-side with the robotic system - a reminder of the time when operators bonded

eight capacitors at a time to the heards resulting in a dozen categories of defects in the capacitors. The robotic system

trolled by IBM's industrial personal computers, increased the speed of the process by only a small margin. But because of their predictability, the robots reduced the defect categories from 12 to two.

"It's easier to track down those two than the 10 or 12 that kept changing in the manual operation, DeTurns says. Prior to the installation of an

A Puma robot, bought from Westinghouse Corp., armed with to install terminating resistors on the boards. Operating with a self-correcting program, the robot will change locations up to five times to find the right force for seating the resistors.

help move boards from station to station, because the boards exceed the weight limits set by safety standards for a single person to lift. It also resulted in a

us locations can determine

which board is being sent to

which station. The data collected

by the bar code readers is com-

municated to the central data

turer's point of view.

er locations. But most boards do not need all the resistors. In fact, great deal of work in process many need less than 350, but extra inventory from a manufac there was no way for the opera tor to know exactly where each resistor belonged without fol Now the boards travel on a track in self-propelled cars. Each lowing a different circuit map for board is stamped with a bar code. each board. Now the robots in

sert the resistors only where they are needed, following a dia gram transmitted by the Se-After it leaves Poughkeepsie a 3090 TCM board is placed in its frame and married with other components at the Kingston

When resistors were married ly unserted, the operators would place all 700 of them in the prop

The Poughkeepsie Accelerated Run-In System (PARIS)



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in hard disk units at IBM's Rochester, Minn , plant

plant. Because of the technology requirements of the 3090, IBM relies heavily on its in-house expertise. There are times however, when outside vendors are called

"The module and advanced board lines are pretty much exclusively built in-house because of the technology, * DeTurns says. "But there are some standard cards that vendors supply. Most of it is driven by work-load buffer requirements. We can bring it in, and when we get work-load peaks, we can subcontract out to ven-

Shuffling off to Chorlotte

In addition to farming out work to vendors. IBM halances work loads within the corporation. Because the company maintams a full-employment policy, IBM will often move work from one plant to anoth er plant that is experiencing low demand rather than lay off idle employees. For eximple, some of the circuit-board work done in Poughkeepsie is currently being transferred to the Charlotte, N.C., plant, Currently, IBM is continuing to bal ance work loads as well as take more dras-

tic measures because many of the plants To match the 50% growth in the plant and enumment budget over the last two years, they would need shipments rising 20% to 22% a year," says Jay Stevens of Dean Witter Reynolds, Inc. "In the last two years, that has not happened at IBM,

so they clearly have excess capacity While IBM does not agree that overs tomating is the cause of its troubles, the corporation is reducing expenses because of decreased demand. For example, more than 15,000 employees, mostly from manufacturing, have been transferred to other jobs within the company in the last

HE plant is designed as a flexible system, so I can take the new product and put it on my line for very little capital. This is a first in IBM - making a major subassembly fit on another line.

JOHN PECK IBM LEXINGTON

The corporation also took the extreme measure of closing a plant in Greencastle. Ind., and giving plants in Boulder, Colo. Hannover and Amsterdam new nonmanu facturing roles. These actions provide a sharp contrast with the practices followed prior to 1986, which are recorded in IBM's annual reports, when the corpora

tion was constantly upgrading its plants UNCOVER 25% MORE S/38 MEMORY.



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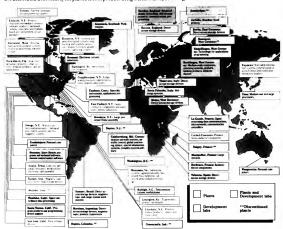
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IBM's worldwide manufacturing empire

IBM's 35 manufacturing plants are located in many parts of the world to serve regional markets — development facilities are associated with most of the plants to link product design with manufacturing



In 1984, additions were made to plants in East Fishkill; Poughkeepsie: Burlington: Charlotte: Endscott, Mainz, West Germany; and Vimercate, Italy. The \$350 milton investment in the Lexington plant was completed and an administration building constructed in Purchase, NY. where the worldwide manufacturns beadquarters is now lo-

In 1985, even though a record low in the per-unit cost of facturing was reported and selective actions taken to reduce expenditures, an additional \$10.8 billion was invested in research, development, property and plants. At the time, more than five milion square feet of new plant and laboratory space was added, and 4.8 million square feet of space was under

onstruction. Included in these figures were the semiconductor uilding in East Fishkill and man ufacturing buildings in Kingston; Rochester, Minn., and Gree-nock, Scotland,

Then in 1986, the Greencas tle closing was announced, workers were transferred, an earlyprogram launched, and the Boulder plant was reassumed as a nonmanufacturing facility. This year, two

other plants have joined Boulder in reassignment - reducing the iber of plants to 35 - and the annual investment dropped back to 1984 levels. "Only two years ago," Fri-

nch says, "you may recall (IBM CEO[John Akers was projecting that this industry would continue to grow at a rate of 15% or 18% or something like that, but in the last two years, we've had to re-

vise our forecasts significantly "And of course, with the lead time in manufacturing, you put investments in place for 15% [growth], and if you only run at. let's say, 10%, you have too much infrastructure in your

manufacturing organization, and you have to adjust. We try to reduce our resources, shift capacity and get into a balanced planin the opinion of many indus

try observers, IBM's faulty market forecast stems from deciis made before Akers' time "The decision to expand by 50% between '84 and '86 was made ears before that time period." Stevens says.

"The blame rests with top management," adds Steven Milunowich research analyst for First Boston Corp., "and John Opel was there at the time.

Akers came in at the wrong time It's not his fault that they made the investment. If the volumes return, this

overautomating will be a benefit," he says, "But there's a real chare as a result question whether the growth rate will return to historical standards, so IBM may have this overhead problem for some

Twin glants

Milunovich makes an analogy between General Motors Corp., which is also known for its mi facturing automation, and IBM In the late '70s, both compames were the No. 1 manufactur ers in their markets, and they

both decided that low-cost manufacturing was the key to staying ahead of the competition, he cave GM which invested in could care with remiler features

was hurt when oil prices can down and consumers wanted bigger cars with more functional leatures. Ford Motor Co. met the need and gained market

"The same thing happened to IBM," Milunovich says, "They said. The competition is going to be AT&T and the Japanese. So they spent a lot on property and plant, and they expanded

volumes. Now here you are in the mid-80s, and it turns out that AT&T is a paper tiger, and it's really DEC that's the problem. DEC doesn't sell on price. they sell on function.

Faced with this argument, IBM points to the efficiencies brought about by the cornoration's investments in automation and the product innovations eenerated by new manufacturing processes. Yet even in these

cated



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instances, capacity problems are evident "The Lexington plant is designed to make a million typewriters a year," Fridrich says. 'We're underutilizing that in-

Obsessab we but a come flexibility to reduce the design point," he continues But we have had some problems over the last two years. We did not have as

As a result. Findrich says, he decided to shift manufacturing of the Proprinter from Charlotte to Lexington to make up or excess capacity. Besides typewriters. Lexington manufactures a variety of printers, keyboards, circuit boards and supplies for other products.

We never dreamed of running the Proprinter here," says John Peck, who

O MATCH the 50% growth in the plant and equipment budget over the last two years, IBM would need shipments rising 20% to 22% a year. That has

not happened, so they clearly have excess capacity.

JAY STEVENS DEAN WITTER REYNOLDS. INC

manages final assembly in Lexington But the plant is designed as a flexible system, so I can take the new product and put it on my line for very little capital. This is a first in IBM - making a major ubassembly fit on another line

Even with the addition of a new prod uct, the Lexington plant will have more capacity to accommodate additional work "Final assembly is pretty much a self-fulfilling prophesy," Peck says. "I will do what I have to to make the boxes that are coming at me. I don't tool up and have people standing there to build twice what my automation by making enhance

Behind this flexibility is a change in thinking that took place at Lexington — which began misking IBM typewriters in

1956 - and led to the \$350 million retooling of the plant. "We've gone from a sate that thought it was a typewriter manufacturer to one that is really making printers that just happen to have keyboards on them," says Dave Ellmann, one of the original design

engineers for the retooling. One of the driving forces behind Lexington's automation was the fact that IRM was losing market share to compet-

ing typewriter makers 'If they hadn't built the manufacturing I need. When I say I have more capacity, it means I have the potential of expanding technology that they del in Legington they might as well have chosen not to compete in the typewriter business," Rosenthal says, "Instead, they designed and built a plant that would allow them to stay





a leading manufacturer in that area. The same formula was carried out at the Charlotte plant a few years later when the Proprinter was developed. IBM was relying on Japan's Epson Corp. to make printers for the Personal Computer. Then IBM made a strategic decision to enter the market with its own product. In 1985, the Charlotte plant reduced printer production costs by using an automated line of 50 robots to produce printers with 90 fewer parts than previous products. which contained 150 parts. The Proprinter captured 18% of the market.

TBM showed that if you really emu late the Japanese approach to manufacturing, which requires oute substantial funds, you can best the Japanese at their own game," Weil says.

Quiet battlefield

ocated in the heart of bluegrass country. IBM's 400-acre Lexington facility is sur rounded by pastures dotted with grazing Kentucky Derby hopefuls. The location seems an unlikely place to make a stand against the lananese.

In fact, rather than view its efforts as copying the lapanese. IBM regards the plant as the culmination of many homegrown concepts prevalent throughout the corporation. An example of this is the net work of Series/1s and host systems that controls the lines in a manner similar to the Poughkeepsie data system

Robotics and automated assembly nes have also been implemented when ever possible. Decisions about what processes to automate were facilitated by a software package first used in Pough-keepsie. The package was developed by two MIT professors, Geoffrey Boothroyd and Peter Dewhorst, IBM contracted the two to develop a version of their Design for Assembly system for the PC for use in

many of the plants. Early Manufacturing Involvement EMI), which brings manufacturing engi neers into the product design process, is

an early 1980s IBM concept that the Lexington facility put to work. reducing the number of parts repured to build its products EMI also led to designs for printers tonewriters and keyboards that have common subassembles that are better sinted for the manufac-

turing process Another progeny of Lexington's EMI project is a "flexible pallet," measuring 26 by 22 by 18 in. Any product that fits on the pal let can be made on the plant's assembly lines. Product designers

stay within these limitations when creatingney models. The only truly lapanese ap prouch used in the Lexington man ufacturing process to Continuous Flow Manufacturing, "CFM way developed by a task force put together to find out why the Japanese were so damned good." Konn says. "They found that the

lapanese were using a lot of concepts that IBM used many years ago and had forgotten because our focus had been on short-term results and a different management direction. Since the task force developed the

CFM concept in the early 1980s, all of IBM's plants have adopted it to a certain extent "It wasn't a mandate." says Richard Daybeamere vice-president of manufacturing for IBM's Entry Systems Drysson.

But there was a desire on the part of the corporate manufacturing organization that said. Here is a technique that we think makes sense, and we'd like each manufacturing organization to evaluate

CFM focuses on cutting manufactur-

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ing costs by reducing the parts inventors to only the amount needed for current production. This strategy, in turn, cuts down on work in process and requires appliers to deliver directly to the produc tion line Japanese-style Kanban queues

are used throughout the process to control the number of parts that hold up at

What is Kanban?

Kanhen is the Japanese word for a manufacturing philosophy of providing a smooth production flow that allows for continual improvements in process Key to this Japanese philosophy is reducing work in process (WIP), as well as reducing lead times, inventory and setup times. IBM incorporates Kanban in its Continuous Flow Manufacturing concept.

The two ideas merge on the factory floor in many IBM plants where Kanban sagns stand over workstations. Numbers are posted below the Kanban sign to represent the minimum and maxium WIP allowed at a workstation to maintain continuous flow down the line. In this manage-by-sight system, the operator can judge the pace of activity on the line by comparing the WIP at the stations with the Kanban limits.

different stages.

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If the parts exceed the maximum Kanban limit - set by the engineers who designed the line - that is a signal to the op erator and manager that a problem must be resolved on the line

The difficulty with CFM is that it rep resents a cultural change for IBM. Dau benmire says. "If you're a materials bigot, you can go back a decade or so and point to a time when we thought that the right way to run a manufacturing facility was to have maximum work in process on the "he says The theory said. You ought to be

able to always see piles and piles of materials,' because that way you could assure yourself that you'd always be able to man ufacture what you needed. We we gotten smarter both here and abroad, led by some other countries, such as the Japanese. We've mackly come to the conclusion that the materials theory is wrong. It **Building** in-house not only created investory, but it also

skiwed down the process.' Daubenmire As with Just-In-Time CFM takes time to insplement, and IBM to still in the midst of a public relateins campaign within certain plants to much the concept

Visible signs

At a board-inspection workstation in Princhkeepsie, a posted sign reads: "CFM wants you." A short distance away, a Kanban sign is hung beside another workstation where the numbers 35 and 43 are posted - representing the work in-process limits for this particular

In Poughkeepsie, automation tor of two. CFM programs like the one at the inspection operation, reduced it by another factor

nf two, DeTurns says. At Lexington, a portion of the CFM concept - giving workers more skills and more responsibil ity - is evident in the creation of owner/operators

Rather than just putting screw No. 3 in hole No. 12, an owner/nperator is responsible for the care and feeding of a set of machines," Elimann says.

The owner operators at responsible for the quality of the work their may hineproduce and for mointaining then-

In addition to automation, EMI and CFM Lexington's production is driven by a deare to hund most parts and products in house For example, more than 40 of the parts for the keyboards are made on

"We decide whether to build our own aniponents or buy them based on three factors - crost, quality and availability, Ellegane says. If we can build more eift ciently, then the manufacturing cost is lower. And there is no one easier to emphasize quality with than yourself

When typewriters and proters began pertuse from machining tools to injection We want to minimize how deeply

we're involved in a supplier school. Peck

Unlike smaller companies, which have less pull with their suppliers. IBM can influence the practices of its outside vendoes because of the volume of ports it requires For example in Lexington, the plant introduced a zero-defect program which uses statistical measurements of defects in incoming parts to push suppliers to improve their quality. Five years agn, only 58% to 60% of the parts passed inspection. As a result of the zero-defect program, more than 90% of the parts are Continued on page 81

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COMPUTERWORLD

IBM's proprietary school

In-house classes offer cross-cultural training

The local point for IBM a numufacturing expertise is the Manufacturing Technical Education Center (MTEC) in Thornwood.

Econded in 1980 MTFC was created because "we desperateneeded to enhance the knowledge of our manufacturing peo-, and we found that the universities were madequate in says Sam Konn. MTEC's director There were some programs, but it was snotty. There a sen't one place to obtain the broad range of knowl edge we wanted our technical professionals to have. So we cre-

One of five educational programs housed in IBM > 300,000 sq-ft Corporate Technical Education Center, MTEC offers classes on-site as well as on a san network to individ Last year, 1,050 IBM imployees attended classes of fered by the center. Faculty members are recruited from the top ranks of IBM's engineers and

We search for people who have competence in a special area and who at the same time have a knowledge of IBM, Korin says. "Most of them have worked in more than one product area so they have a broad appreciation of how the company operates

Such qualifications are essential because the subject matter covered at MTEC usually includes proprietary information Within the scope of an area

such as contactonount technol. owy, optoelectronics or contamo nation control, we teach things that are not being taught or cannot be raught, because we have proprietary capability or knowledge.' Korm clasms

The institute takes security necesures to prevent competitors from gaining access to cer tain aspects of the curriculum For example, satellite transmissions - which orginate from a control center in Thornwood are ductured and encoded, rather than sent in an analog format, to prevent interruntion from outcude controls

One of the most amportant MTEC courses to "Managing Materials and Process Technology" (MMPT) because it is designed to provide materials man agers with an understanding of

the chemical processes required e current IBM products MMPT takes the technical professionals from one culture and puts them into another

Spreading aut expertise In the past, chemical technology expertise was restricted to the staffs at semiconductor plants in Burlmeton, Vt., and East Fishkill. N.Y. The other locations

were known as "box plants" because they built systems requir ing only mechanical assembly. Today, everything from key rds to magnetic-disk head: requires chemical processes and relies less on mechanical assem bly. Korin says. In a keyboard, for example, the only mechani cally assembled component is a spring that clicks to let the user

Magnetic-disk read/write bead are manufactured then-film technology - a chemical process that deposits copper to form a sec ral coal rather than mechanical ly winding hard

wire. The chemidepositing techwhich niques, be permust formed in a clean

are starting to look more like Du Post than traditional computer manufacturing," Korin says, "I through my own culture shock every time Evisit them MTEC is also shepherding

IBM's manufacturing profes sonals through cultural trans formations such as Early Manu facturing Involvement, which requires that a product be designed in conjunction with the manufacturing process, and Continuous Flow Manufacturing (CFM), which significantly re-

When you get dependent on entory, which we were, the whole idea of not having food in the refragerator is your upbringing," Korin says. To go hand to mouth like this suggests you may not be able to deliver your product, and that is heresy at IBM."

IBM is asking its managers to

take this risk to save money on inventory, work in process and

logistics requireme What we didn't understand is that you don't need the protec tion of inventory if you have a system worked out with your uppliers and your own people that disciplines them to keep the process flowing continuously,"

Still the transition is not easy. "It's like being left-handed all your life and being forced to go to using your right hand." he

Until recently, MTEC relied on a 10-week course - permeated with CFM training - to indoctrinate its stude nts in most of the concepts of IBM's manufacturing technologies. The course has been postponed this year because the corporation is focusing more on skill building and less on concepts.



Technical Education Center, experiment with a robotic arm

With a large number of manu facturing employees being trans ferred to other operations and the reorganization that is reourred by new automated lines the plants are each conducting extensive retraining programs, and the emphasis at MTEC is on skills that can be applied quickly to the workplace

CIM refocused Among the courses currently of

fered at MTEC is "Integrated Manufacturing Systems," IBM's name for computer-integrated manufacturing (CIM), "We call it by a different name because we don't want to highlight the com puter as the key component of the manufacturing system Korin states. "It's only one of the components

Another course is "Materials Science Manufacturing," which presents an overview of the properties of materials used in nucroelectronics. The pattern ing and depositing of thin-film technology is reviewed, as well as nissing use and ion-beam processing. Other courses cover contamination control, surfacemount technology, optoelec tronics and expert systems. As the gathering place for ex-

perts in IBM's manufacturing echniques, MTEC provides of other service, which Korin calls "cross-pollination." Managers and engineers from plants throughout the world take advantage of MTEC's formal and informal sessions to exchange sleas. Konn says such discussions lead to more efficient processes as well as promote consis tency among the plants. This consistency is especially important because of IBM's tendency to transfer work between plants in response to fluctuating man This is the most interactive

interdependent company of any I've ever seen," Korin maintains. "We have more people in the air at any one time than any-MICHAEL SUILLIVAN TRAINOR



productivity, versatility and sophistication,

networks, clusters, international languages, file compatibility nod integration of other products, we bad already reached the standards in these areas

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\$22 billion EROM PAGE TO

nnw acceptable, and many of the plant's inspectors have been re trained and moved to other jobs. The presidice toward inse product construction does

not carry over to manufacturing processes. Here, the Lexington plant's approach is to use what works — whether it is IBM's or

We choose machines that are effective in manufacturing capability, rate of build. quality and cost. how them if they already exist rather than

aid one of our own. We don't want to re create the wheel," Ell-In addition to not wanting to duplicate others' work, Lexington uses outside ven-

and processes because there often is not time to develop a process in-Technology races ahead so quickly that if we waited for the latest

process to be developed, we would never get into building an effi ent product," he says. For example, to accommodate the Pronter line. IBM bired

Jervis Webb, a manufacturing systems integrator in Farmington Hills, Mich., to imple-ment an IBM-designed production line that

uses a combination of robotics and manual assembly The wilingness to use other

vendors' manufacturing equipment does not prevent IBM engineers from experimenting with automation, however. Such experimentation led to break throughs such as the first tactile ang robot In 1980, IBM developed ro-

botics that had tactile capabili-Boston University's Rosenthal says 'They were used within the company before they were released to the nublic They are able to sense the difference between electronic parts by touching them

They allow flexible manufac turing canability because the rebotics are no longer just assembling the same components dayin, day-out. They allow you to mix a sequence of different kinds of boards in the assembly line depending on production require

he says Although they perform assembly tasks in many of IBM's plants, the robots also perform less compley tasks than parts differentiating. At one point, they were used by Lexington plant engineers to stamp bar code la-

hels on products. It's not an application we would have chosen for a sophisticated robot, but it grew out of the plant manager's telling the engineers that they needed to work on the line," Ellmann says. So one day the engineers

'Succetash plants' Other plants are more difficult to

automate than Lexington because of dissimilar product lines and product change due to work load balancing. Within IBM, facilities of this type are jokingly called "succotash plants." to sig-



HE diversity presents us with a greater challenge. Also, it allows us to be more vertically integrated than other plants.

> LADDVOCTEDWICE IBM ROCHESTER

mily the mix of products they are producing Located about 90 miles from

Minneapolis, the 7,000 employees at IBM's Rochester, Minn., plant use a mixture of automated and manual processes to produce the System/36 and 38 proces sors, the System/36 Personal Computer and direct-access storage devices (DASD) ranging in capacity from 20M to 400M bytes

The diversity presents us with a greater challenge," says Larry Osterwise, site manager of the Rochester facility. "It requires more knowledge and exnemence. Also, it allows us to be more vertically integrated than

other plants. Pilot lines at Rochester build circuit boards used in the interate systems. Dasks and dask heads are assembled and also put into the mid-range products

Touted as the largest IBM facite's under one contiguous roof. the 3.6-million-so-ft plant is equivalent in size to 76 football fields. While there are larger sites within IBM. Rochester holds its title by maintaining cov ered walkways that connect

most of its 31 buildings. The walkways are vital to the vertical integration of the plant and the implementation of CFM Automatic guided vehicles called "Raymonds" room, the corredors, taking parts to assembly lines and finished goods to trans-

fer locations Unlike the highly automated, underd processes of Lexination and Poughkeepsie, Rochester is a plant of multiple personalities. with each area manager applying different resources to meet CFM

We're trying to continue our quality record, reduce cycle time and improve our efficiency and flexibility," says Al Moschner, System/36 and 38 product man-

CFM. implemented in 1984. is already generating significant benefits. In circuit boards, for example, in which \$500,000 worth of inventory moves along the line daily, the cycle time from the start of build to delivery was reduced from 20 days to less than five. "If you multiply 15 days by \$500,000 a day, you can see that CFM gives us a tremendous amount of leverage Moschner says.

ull' system

ager

CFM also allows the plant to be more flexible. "The industry has had its ups and downs of recent times. If the business is stalling, you want to turn off your manufacturing engine as quickly as Moschner savs YOU CAR " you've got long cycle times and you have all this stuff in process. you've bought the farm. So the shorter the cycle time, the less risk you have in a downside. And if your business is up, it takes

less time to react to the upsid because the supplying departments await actual requests While production volumes for each product are based on marfrom the pulling departments inket forecasts, which fluctuate stead of building up inventory based on estimates. The system thly, the subassemblies of

A Rochester worker assembles the System 36, which is ruised on a boast foreamer access also includes buffers with Kan

certain products are built according to a "pull logic system. An integral part of CFM, the null system allows one depart more - such as systems - to pull the parts to build its products from another department - such as disk assembly - as needed. This system reduces work in process and inventory

han limits that prevent too many or too few parts being built at any one stage of the process Other manufacturing con

cepts are implemented in unique fashion at the plant. In the 54x-in bard-disk area where Model 0665 20M 40M-byte disks are made for Personal Computer ATs and PS/2s - a "dean tunnel" is Windows



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time Tom Leffler and his team from Unisys met with Home opping Network they recognized a big idea whose time had come

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computer system. A system that could satisfy their immediate needs, but could also grow, and fast. There would be no time for software conversions. And, if that system wasn't in place on time, that

window of opportunity would slam shut. "We started working with HSN in April 1985. They were scheduled to go national on July 1, 1985. There were three months to rewrite an application, build a computer

room and get on-line with a national system." Working with the LINC productivity tool

and nine Unisvs professionals, HSN had a working application in 90 days. In the next 18 months, they'd grown from zero revenue to almost \$700 million. 'And they'd grown from our smallest mainframe to our largest computers. It's been incredible

"But, you know what really won us the business: Unisys' entrepreneurial attitude and a willingness to get things done. We accepted our challenge to be a part of the whole plan."

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hoods and gloves, assemble the hard disks by maneuvering components inside a plexiglass tunnel. The assemblers reach under the plexiglass to accomplish their tasks. Class 100 air flows down on the files from the top of the tunnel. Red lines mark the central nectangular aisle where the workers sit

Mobot buddies

Automation also came to the Rochester plant in many forms. the bulk of it going toward prod uct testing. A pair of mobots (mobile robots), affectionately named "Sven" and "Ohe," work inside a floor-to-ceiling clean tunnel attached to a clean room where 200M- and 400M-byte Model 9332 bard disks are made for the System/36 and 38 .The mobots act as handlers, gliding on wheels and placing assembled

EMI also played a role in improving the Rochester operation, says Al Cutaia, manager of future development for Rochester's laboratory. For example surface-mount technology used in the circuit board line required design engineering changes to the boards to enable them to be

The temperature coefficients of the chin and the board connec tions "are worlds apart," Cutaia declares. When they are sol-

dered together directly as they are in the surface-mount process expansion differentials occur When we tested the process, we were ripping connec-

tions, and we were not able to produce a board with reliabil-Cutara says, "We solved the metallurgy problem through the

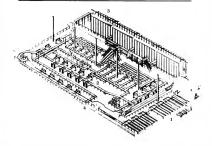
The ability to implement surface-mount technology in production is a first in the industry Other manufacturers may soon match IBM's ability to use the technology, however In the meantime, the solution to the metallurgy problem is a closely guarded secret. Manufacturing managers will discuss it but stop at the point of the mysterious metallurgy solution. Further questions will result in the standard reply, "Sorry, that's propri-

Where will the combination of in-

estments in manufacturing technology, fluctuating markets and new concents lead? Berhans the answer hes in what IBM chose to do with its latest prodnct - the PS/2

Once the site of Series/1 man ufacturing, the Boca Ration, Fla. plant is now the center of PS/2 activity. Like Poughkeepsie Boca Raton is the assembly point

for parts from other plants.
To eliminate setup time for different products, all eight PS/2 models are built on common lines using a flexible pallet dePersonal System/2 assembly line



roduction of the IBM Personal System/2 - a 10-hour process - begins with (1) kitting, where parts from other IBM plants and outside vendors are placed together on a common pallet. Designed to fit all eight PS/2 models, the pallet carries the system throughout the operation. After workers stick a bar code label on the frame. the system moves down a conveyer to (2) assembly Once there, an assembler, wearing a wrist strap to ground

him, plugs in wire connectors and uses a touch-screen IBM Personal Computer XT that relays assembly instructions and not fies an IBM host of the completion of each operation. In addition the assembler uses a laser scanner to read the bar code, transmitting the location of the system and its major subassembles to the host. Finally, the assembler plugs in a connector block some mon to all models regardless of size, and inserts a test diskerte which is used as a log for (3) the test princess

After an initial screening, a mobile robot (mobot) bits the nascent PS/2 off the conveyor and plugs it into a slot in one of the test bins (see photo below). The connector block allows the mubut to automatically insert the system into the correct location and the computer-controlled running test system determines which model it is handling from the har code data.

An inspection is conducted before the system moves to 14 ver-fitting and final assembly, after which the PS/2 travels up a spiral conveyor and disappears into the packaging complex

in the same leasting

We went through the 60s-

What is next? "More of th

Imagine how much that will

signed along the lines of the Lexington one. (See story above.) They are made with fewer screws than their PC predecessors, thanks to EMI in product Conveyors move parts from

one step to the next, and har code readers allow the plant's host data system to track the location of all components. The data is used to prevent defective components from going farther down the line, and it is stored for the day when it may be needed to trace the cause of a problem at a customer site.

One of the last plants to implement CFM, Boca Raton relies on Kanhan to reduce work in process, and supplier deliveries are made directly to the lines At various stages, manual processes are maintained

We've studied the balance between automation and using hu man hands," says plant manager lohn Alcott, "We get a better return on investment by having manual assembly balanced with automated testing.



moves PS/2s into test bins

CFM concepts led to the replacement of robotic bar code

scanning systems by manual scanning during assembly We looked at the balance of the various operations and found we could eliminate the robotic scanning by combining it with

factor mere maintains."If I'm bringing out a signal to a pin, and the next put has a completely different signal, I want the facility to address that pin for what it is. We do that so it doesn't put any encumbrances on the design. It doesn't say Pin A must always be

Of all the aspects of IBM's m-Along says vestment in minutacturing in Boca Raton and eisewhere The

DASD operation least expensive - CEM - is the most significant. Korin says plant, mobots are used to move the with value engineering assembled syssays. 'Then there was the high tems to testing volume/low-cost concept. We've Plugged into the introduced group technology and automation EMI has done test bins via a us a lot of good. But CFM has had tion, the PS/2s the greatest impact because it are tested by a requires cultural change computer gram that can desame. Kurin says "We will be termine the dif-

prefiging our people for assemhis of products atom by atom molecule by molecule. We re already talking in terms of molecutesting is a major

" Dauben-We've already proven you can make perfect ball bearings and silicon crystals of extraordi nary purity and size in space Korin continues. The next dramatic evolution will be in zerogravity manufacturing



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be included in debates over the ments of hostile takeovers, be-

comes clear in viewing the

That danger, which should

Allegs Corp., the parent of Unit-

Allegis is being pursued by

United's priots on one flank and

by a triumvirate of New York

investors on the other. Their

campaigns are typical of many

of the more controversial corpo-

rate raids in that the aggressors

seek to divide the company and

ers, generating a helty premium

over the purchase price and the

Arguments about the ments

present value of the sharehold-

of this practice often revolve

maximizing shareholders' short-

what the break un would bring)

vs. their longer range interests

in allowing a more traditional-

minded management to pursue a long-range - and perhaps

Continued on tope 86

around the relative values of

ers' investment

som off parts to various own

tems' bealth

Tax reform nixes contracts

DPMA members say Section 1706 will jack up their costs \$4.4M

BY DAVID A LUDLUM

A recent survey of members of the Data Processing Manage ment Association (DPMA) found that 15% of the respondents have canceled contracts for independent computer consult or plan to do so, because of Sec tion 1706 of last year's tax re-

The canceled contracts rep resent \$6.7 million worth of services - about \$20,000 for each independent consultant involved - and the cancellations are expected to increase the costs of

the services by \$4.4 million, according to the DPMA, which has taken a public stand in opposition

Section 1706, which took of ct on lan. 1. requires indepen computer professionals placed in jobs by a broker to be come employees of the broker for tax purposes if the broker has significant control over their work. The degree of control is

determined by the application of common-law standards to individual cases Many organizations have interpreted the law as also calling for independent computer pro-

design their own telecommun-

cations function, both on the

voice side and data. That s had

the tendency of driving the tech-

fessionals under direct contract with an organization for which they work to become employeeof that organization if it controls their work. Several pending con gressional bills call for repeal of the section or delay of its implentation while it is studied. In April, the DPMA, whose stand against Section 1706 was rompted by concerns of members who are independent con sultants, polled a random sampling of its members, not all of whom are MIS managers, and received 200 tenhes, according to Joseph E. Collins, the group's

gets driven, the skills get more

Continued on page 88

specialized," O'Connor said

Beyond the slipstick at MIT

BS DAVID A TODAY M

CAMBRIDGE Mass - The faculty of MIT has approved new academic requirements arrived in part at providing engineering and science students with a bet ter preparation for policy-mak ing role-

strengthens an existing policy Continued on base 88 manutes arts and social sci those areas to once a broader weep of those fields and allows MIT students, for the birst time to graduate with a minor concen-

> The changes reflect the line tations of rechnical learning for policy makers and emphasize the consequences of technological undertakings and the public trust held by technical professionals, sass Margaret L. A. MacVicar, MIT's dean for undesignations education and a

"Expectable in the technical areas students knowledge will become obsolete very quickly It's best to give them a strong base in terms of the most fundamental issues and a healthy respect for the approach to learn ing," MacVicar said

Such an education will give students the ability to conti their education in their specialties throughout their lives "with a special emphasis on serving the Continued in page 88

Area head stop DP executive 93 Head of the data cen .. 45

Telecom savvy keys execs' pay hikes

NEW YORK -- Information systema executives with telecommunications experience once again have led their colleagues in salary increases, boosting their base pay 18% last year, accordmg to the most recent edition of

The average pay raise reported for managers with a telecommunications background far outpaced the average increase of 7.5% for all of the 1.059 executives in 23 job categories survessed by Edward Perlin Associaties. Inc. m New York (see chart at night).

The nattern reflects a trend of AT&T, of corporations devel-

facilities, according to Roger O'Connor, a spokesman for Per-They're all going outside to

Aetna vice-chairman snares annual MIS award

William O. Bailey, vice-chairman of Aetna Life & Casualty Co. in Hartford, Conn., and chair Whate Plains, N.Y.-based MBIA. Inc., an Aetna subsidiary that in sures municipal bond offerings has been chosen winner of the 1987 Excellence in Technology Award The award, sponsored by the

Gartner Group, Inc. in Stamford Conn. Business Week and the National Computer Conference, will be presented at the conference this week. It is presented annually to a chief executive officer for leadership in managing information technology. The sponsors cited Bailey's

on in development of Act-Safarı system, which mation to its automobile insurance back office in the 1960s; the Aecclaims system, developed in the early 1970s, which now handles more than 200 000 transactions per day for health insurance claims; and the Gentina office automation system for independent insurance agents. which was deployed in the late

The sponsors also noted Barley's role in lobbying for the Pri vacy Act of 1974, which limits disclosure of federal agencies' intion on individuals. Bailey graduated from Dart-

mouth College and received a master's degree in business from the University of Pennsylvania's



Wharton School. He joined Actna in 1954 and handled underwriting and marketing assign-ments in its Casualty Division followed by general manage-COMPUTERWORLD

onsibility. The supper of the award is osen by a vote of a committee of eight senior information sys tems executives, who nominate up to three candidates each

Strategy work louded John W. White, vice-president of information systems and services at Texas Instruments, Inc., said Bailey was recognized pri marrly for his work with Artna's

information systems organization to develop its strategies and direction "However instrumental in idea. tifying where they can apply in-

try," White said

Another thing that kind of stock out in my mond." he added. was that he has been involved in the information systems sup nort area for some years. He is not a 'one-idea type of guy.

White said that in serving on the award selection committee for several years, he has found a tack of chief executive officers who are highly qualified to win with few additional candidates

emerging from year to year While there are always candi dates with an interest in informa tion technology. "It is unusual to find people who have the mtense interest and motivation White said. In addition, some compa mes avoid publicity for strategic information systems to product a competitive advantage, he not-

Merger skies

pilots and the investment part-

nsky — straten Such is the case with the attack on Allegis, which is a con-glomeration of United. The Hertz Corp. rental car operation and the Westin Hotel Co and

nership seek to buy the company and sell off some of those units while Allegis Chairman Richard Ferris doggedly pursues his vision of the company as an integrated, one-stop provider of

heavily on the use of an integrated information systems network that presumably would go

beyond the capabilities of other airlines, which offer combined points for the frequent-filer program through joint marketing arrangements

At a news conference earlier this year. Ferris said Allegiwould develop a unified data and botel operations, providing

tion such as customers' prefer ences in airplane seating, car But Alleges has done little to

deliver any benefits from Ferris's vision or even offer a more The most visible step the change its name earlier this year from UAL, Inc. to Allega, a melding of two Latin words that

New York real estate magnate Donald Trump - also considered a possible Allegis suitor interested in breaking up the company - described as sound me like "the next world-class

Call to arms

he lack of progress has helped prompt the call to arms by takeover artists, and there lies the threat that hostile takeovers pose to the concept of stratego mformation systems. It takes time to implement a strategic system, let alone a corpor atewide strategy that depends on information systems. Today's environment of mergers and acquisitions — both friendly and commodate such ambitious, far

It should be noted that even d Ferris's grand scheme materi alizes quickly, some observers

question it. First, many of the services may still be within the capabilities of cont marketing pro grams. Second, it's not clear that customers want a one-stop travel service that would, for one thing, limit their choice of ho tels American Airlines abandoned a hotel operation several years ago, and Pacific Southwest Airlines sold its hotel and rental car businesses in the 1970s. Such doubts only add to anxieties about Allegis's lack of movement in deploying its Corporate leaders should be

accorded some protection from preoccupation with short-term results, but under the present rules of the free-enterprise game they must balance long range returns with present val ue. That's one or the many sets of imperfect options that they are paid to resolve Corporate managers have to be responsive to reasonable ex-

pectations of customers and shareholders, at least to the extent of displaying an aggressive attitude toward developing new services and nerbans narrial moves Allegs has not made.

Of the company's plan to integrate its travel services, John Zeeman, Allego's marketing vice-president, was quoted last year as saving that when an or United, which at the time was the nation's largest airline, "it's difficult to decide to risk every thing on a whole new approach

But more recently, Frank Lorenzo, the chairman of Texas Air Corp. — which has over-taken United as the largest carri er by adding Eastern Airlines and People Express to its Continental Airlines - was quoted as saving, "History has shown that the companies that didn't take risks took the biggest risk

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Tax reform FROM PAGE 85

governmental affairs manager We've been assuming a lot of things would happen, and we wanted to address those assump twens in some way." Collins said The DPMA emphasized that 35% of the respondents reported they have changed their conering changing them as a result

Collins said he expects DPMA

members to continue cutting

back on contracts with independent consultants and their brokers and mcreasing business with technical services firms that use salaried empl People are turning away from

them, and not only that, it is costing them a lot of money." he

Of the 35% of respondents who said they are making changes or considering them, 74 so said they have canceled th unsultants and 60% said they have canceled contracts with broker- Forty-eight percent

said they have increased their contracting with technical service firms that use salaried em

Moking the conversion

indicate some of these changes reflect organizations substitutune a firm with salaried consuldent concellant. He wided however, that some reflect orgasulting firm that has converted from a broker of independent consultants to an employer of

salaried consultants they expect no change in quality Some of the changes also reand 13% said they expect in flect organizations that had used creased quality

the services of independent con sultants hiring the consultants as salaried employees, he added, It's not the route they'd like to take, but they are because of the choices they're left with here More than three-marters of the respondents making changes nr considering them said they expect that doing so will increase the costs of services. Mean-

while, 18% said they expect the

hanges to diminish the quality

of the services, while 69% and

International Conference on

Neural Networks. San Diego

lune 21-24 - Contact: IEEE

The survey found that before the law took effect. 29% of the respondents used technical sersoco firms with salaried employees. 25% contracted directly with independent consultants and 6% used independent con-

sultants placed by brokers As reasons for using indepen dent consultants, respondents cited expertise, availability, low cost, quality, reliability and a heavy work load over a short perod of time.

Pay hikes

The big pay boosts tended to go to manager- of network planning and telecommunications oftware but not to those overseeing telecommunications services, whose average raise was Strong corporate earning last year hought some too information systems executives an base salaries, according to the

pensation for some data processmg managers at the nation's largest corporations well into six figures, it found

Bountiful botch o boon The practice of awarding such bonuses to top information systems executives is not new, but the size of the latest mond is un-

usual and stems from general corporate performance, O'Connor said It's probably the highest we ve seen to this date. he said The large bonuses only go to all seen as very critical in terms of value added to the corpora-Among the 23 nm categories

averages for total compensation ranged from \$71,800 to \$275,400. The professional expersence of the executives averaged 21 years - 17 years in ex-

organizations averaged \$80 millon a year, with some more than \$100 million. The organizations DP staffs averaged 815 professonah and 1 180 total employ

degree program in "technical liberal studies" that will seek to

combine competency in the two

the faculty's Institute Commit

tee on the Humanities. Arts and

Social Sciences. It was debated

during a vote at a May 20 meet

ing attended by about 150 of

MIT's roughly 1,000 faculty

members. A petition opposing

some of the changes was signed

raised questions of whether stu-

dents might have to cut back on

technical courses, which could

programs, and whether engi-

nniony and the liberal arts in four

MacVicar said. If not, the solu-

tion is not yet clear and could in-

volve graduate school, continu

ing education or a 12-month

undergraduate school year, she

She added that the reforms

"Some people are asking

have not been prompted by a cri-

What's wrong? But the fact of

the matter is, things are going

quite well, and our students are

said. "The question is whether

in great demand." MacVicar

preeminence

It's quite possible there just

enough time for both

standard academic years

reform movement has

The reform was proposed by

areas, MacVicar said

by 1,500 students

Square pegs?

DAVIDATIONEM effort may be creation of a new

ILINE 21-27

leans, June 21-25 - Contact: Maxi Greer, SSC Registration System Software Division, Uccel Corp., P.O Box 660054, 6303 Forest Park Road Dallas Texas

The Payments Institute Boulder, Colo., June 21-26 -Contact: Barbara Hill or Sandy Kennedy, National Automated Clearing House Association, Suite 640, 1901 L St. N.W Washington, D.C. 20036.

Integrating Publishing Systems. Newton, Mass. June 23-24 - Contact: Bruce man, Xernx Systems Institute, Xerox Corp., 475 Oakmead

top Publishing Forum. Los Angeles, June 23-24 - Contact: Betsy Nagle, Hara & Associates Suite 301, 2 Nickerson St., Seat-

Contact: Online Internati

Software Tools 87, London June 23-25 — Contact: Online International, Pinner Green

Eighth International Computer and Management Show for the Design and Construction Industry Washington, D.C., June 23-26 - Contact: Conference Dire tnr, A/E/C Systems '87, P.O. Box 11318, Newington, Conn.

DAR 1987 National Educational Computing Conference. Philadelphia, June 24-26 - Contact: Frank L. Friedman, NECC '87 Department of Computer and In formation Sciences, Box JAI Computer Activities Building

CAL

The hormers bring total com-

MIT

FROM PAGE 85

public good "she said concedes with several other changes at MIT recently, includog the creation of the institute's first undergraduate concentration in MIS. This spring's graduating class was the first to have the option of taking the fourcourse MIS concentration within the management science degree

leff Meldman, chairman of the undergraduate management science program, said the importance of the broad curriculum reform to future MIS managers goes beyond their careers MIT ones its undergradu-

ates a general liberal education not just the engineer. This gets people out of the idea that every thing is reduced to their professonal field. 'Meldman said MIT's current requirements all for all students receiving a

bachelor's degree to take at least eight courses in the humanities. sets and social sciences. That requirement will stay in place. But starting with this fall's freshman class, those students will be required to take one course in three of five broad newly established areas: the

arts: cultures and societies: historical studies; language. thought and value, and literary and textual studies The courses will be chosen from a list approved by the faculty. Prompted in part by student

the top information systems managers, he added. They're

opposition, the faculty also rejected a proposal to limit the length of the list to 50 courses and agreed not to set a specific

Currently, students are re-23 more parrow liberal arts fields, making it possible that all three are for anamole from the social sciences. Those three courses must be chosen from a



With the reform, students also will have the option of taking

ax courses an a related field n the humanities, arts and social sciences to graduate with a minor concentration in that field. As a longer range goal, the reform effort is aimed at the cre-

ation of "contexts" courses that MacVicar said would address 'the human contexts in which science and technology are pursued," stressing ethical and socal issues. Three such courses may be tried out within the next year, she said. Another future thrust of the

First Annual ICNN, Nomi Feldman, 3770 Tansy St., San Diego, DP hudgets at the executives

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4th Annual Microcom Managers Association Meeting & Show, New York, June 29-30 - Contact: Annie Zdinak H A. Bruno, Inc., 333 Sylvan Englewood Chffs, N.J. 07632

NCITO International Trade and Computerization Conference and Exhibition. Washington, D.C., June 29-July 1 — Contact: Europe A. Hemley, National Council on International Trade Documentation Suite 1200, 350 Broadway, New Vork N.Y 10013

syntopican XV. Dallas, June 29-July 2 - Contact: Associa uon of Information Systems Pro essionals, 1015 N. Ynrk Road. Willow Grove, Pa. 19090.

IUIY 5-11

Digital Document and Im-age Automation: User-to-User Forum I. New York, July 7-9 — Contact: Randy Martin. The Yankee Group, 200 Portland St., Boston, Mass, 02114.

JULY 12-18

Fourth Annual Information Center Conference & Expo sition. New Orleans, July 12-16 - Contact: Julia Stasso, Wein garten Publications, Inc., Chauncy St., Boston, Mass.

IBM Users/DEC Users Com puter Security Conferences. Philadelphia, July 13-14 — Contact: Computer Security Institute, 360 Church St., North boro, Mass. 01532. AAAI-87, The Sixth Nation

al Conference of the Amer Continued on page 90 From 360K to 70MB, we've still got your number.

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Continued from page \$8 can Association for Artificial Intelligence. Seattle July 13-15 — Contact: AAAI-87. 445 Burges Drive, Menlo Park, Cald 94025.

Chief Information Officer: Teaming for Profit. New York, July 14-15 — Contact. William Smulsky. The Yankee Group, 200 Portland St. Bos-

ton, Mass 02114

AM/FM International Conference X. Snowmass, Colo., July 20-23 — Contact: Barbara Emery, Automated Mapping/Facilities Management International, Suite 820, 8775 E. Orchard Road, Engleswood, Colo.

The Federal Desktop Publishing Conference and Product Showcase. Washington, D.C., July 20-23 — Contact: FDPC coordinator, 3825-1-S. George Mason Drave, Falls

Church, Va. 22041.

The Desktop Publishing Conference. Arlangton, Va., July 21-22 — Contact: The JLS Group. Inc., 7485 Dentille

Court, Annandale, Va. 22003,
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Financial and Computer
Automation Conference,
New York, July 22-23 — Contact: Jim Misen, H. A. Bruno, Inc.,
333 Sylvan Avr., Englewood

Cliffs, N.J. 07632.

Microtrends '87. New York, July 22-24 — Contact: Interna-

tional Communications Industries Association, 3150 Spring St., Fairfax, Vz. 22031.

JULY 26-AUG. 1

Computer Associates International, Inc. Annual User Conference. Orlando, Fla., July 26-31 — Contact: Barbara Pascock, Computer Associates, 711 Stewart Ave., Garden City, N.Y.

1987 Summer Computer Simulation Conference. Montreal, July 27-30 — Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

Siggraph '87 — The Fourteenth Annual Conference on Computer Graphics and Interactive Techniques. Ansheim, Cald., July 27:31 — Contact: Siggraph '87 Conference Management, Smith Bucklin and Associates, Inc., Suite 600, Chicaso. Ill. 6006.

AUG. 2-8

Annual Remittance and Document Processing Forum. Sen Francisco, Aug. 2-5 — Contact: Recognition Technologies Users Association, P.O. Box 2016, Manchester Center, Vr. 08255.

25th Annual Conference of the Urban and Regional Information Systems Association. Fort Lauderdale, Fla. Aug. 2-6 — Contact: URISA, 319 C St. S.E., Washington, D.C. 20003.

Resource Access Control Facility Users Conference. Anabeam, Cald., Aug. 3-7 — Contact: Roan Bailey. Vanguard Integrity Professionals, Suite 109, 1720 E. Garry St., Santa Ans., Cald. 92705.

The Seybold Group's Desktop Productivity Conference. Boston. Aug. 5-7 — Contact: The Seybold Group. Inc., Sunte 100, 100 Homeland Court. San Jose. Cald. 95112.

Extending the Human Mind: Computers in Education. Eugene, Ore., Aug. 6-9 — Contact: University of Oregon Continuation Center. 1553 Moss St., Eugene, Ore. 97403.

AUG. 9-15

Spocade III CAD/CAM Conference. Coeur d'Alene, Idaho, Aug. 9-11 — Contact: Spocad, E. 502 Boone Ave.. Spokane, Wash. 99258.

International Computers in Engineering Conference and Exhibition. New York. Aug. 9-13 — Contact American Society of Mechanical Engineers, 345 E. 74th St., New York, N.Y. 10017.

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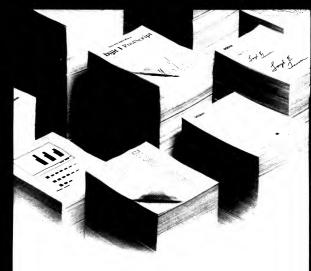
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Such an exercise in espinage could prove rewarding not just for its prurient appeal but for the collection of buzzwords that the executive would undoubtedly blurt out in his sleep.

During the worrisome times since the early '80s, the eavesdropper would have repeatedly recorded such words and phrases as "deficit," "book-to-bill declines," "niche market" and "lapan" from the bedside of the restless chief executive of-

These days, however, there might be a few more snoring sounds recorded, interrupted from time to time by the latest buzz-phrase to emerge during rapid-eye-movement sleep: strategic partnership

Saying the J word It has become apparent to just about everyone that the U.S. chip industry is only going to make it if manufacturers stick to gether and join forces. That includes not only working with other U.S. chip companies but also with those from abroad. Yes, that includes lapan. At a recent semiconduct

conference in New York, James

Diller, president of Sierra Semiconductor Corp. in San Jose. Calif., summed it up suc cinctly: "It's virtually imp now for a new or even established semiconductor company to do everything on their own The key today is to focus on what you do best and use alliances to complement the rest," he said. In the past, U.S. semiconductor companies anded them selves on doing things their way, standing strong and independent. Times changed, bow ever, and before they knew it. the lananese were underpric ing and overselling the U.S. coms at every opportunity Then the bottom dropped

Continued on page 98

Reagan cuts sanctions by 17%

Says Japanese vendors making headway in curtailing chip-dumping

BY MITCH BETTS

WASHINGTON, D.C. - In a goodwill gesture toward Japanese Prime Minister Yasuhiro Nakasone, President Reagan last week reduced the U.S. trade sanctions against Japan by 17% on grounds that Japanese manufacturers have made progress in implementing the 1986 semi-

conductor trade pact. But Reagan said Japanese impliance with the semiconductor agreement was too mod-

est to completely eliminate the punitive tariffs imposed six weeks ago on certain imported Japanese electronic products. The 100% tariffs remain in ef fect for 16-bit laptop and desktoo microcomputers, certain power tools and 18- and 19-in. television sets.

The president's action, takeo at the start of a Venice economic summit with alies, removed the 100% tariffs levied on 20-in. vision sets and thus trimmed the \$300 million sanctions package by \$51 million, or 17%

Reagan said the partial lifting of sanctions was strictly propor tional to the improvement in the lananese semiconductor tradpractices that had triggered the sanctions. The bilateral semi conductor trade pact requires Janan to among other things ston dumping chips in third-country markets and open its own domestic market to U.S. vendors.

Curtailing practice Administration officials said the move was based on U.S. Depart ment of Commerce figures showing that Japanese clup makers were curtailing the practice

of dumping - or seiling below market value - dynamic ran dom-access memory (RAM) chips in third countries. The Commerce Department has defined fair market value as 8% above the cost of producing the chips. Preliminary figures show-ed that lanan was selling dynamic RAM chips at 88% of fair mar-

ket value in May, up from 59% in February and 84% in April. Reagan's announcement was

apported by the U.S. Semicon ductor Industry Association (SIA), which had pressed for the sanctions. "We agree with the president's statement that dumping of dynamic RAMs appears to have declined. There may also have been some improvement in the unfair trading of EPROMs [erasable programmable read-only chipsl." said Andrew A. Procassini, SIA president Continued on page 99

MIS and the work group. Novell plans to expand its existing limited direct sales effort to provide corporate users with sales, service and support of its

Continued on page 102 Kudak division sues lo-megs for breach of contract. Page 96.

Novell will

sell direct

BY ALAN RYAN and PATRICIA KEEFE

PROVO, Utah - Under pres

sure from some of its largest us-

ers. Novell, Inc. 15 preparing to

bunch a direct sales program

that is expected to account for

10% to 15% of its revenue nex

great we had to do something.

said Craig Burton, Novell's vice

president of corporate market-

ing and development, in an inter-

Comdex/Spring '87 in Atlanta

While acknowledging that No

vell "doesn't know how to sell to corporate accounts."

said the company is "in a unique position to be the glue between

the

recent

Burton

"The pressure became so

to users

• Lotus CPO announces re

ignation. Page 96.

• Mentor seeks da \$18M from EDA Systems.

Data View



RM rentals

DITURBATION PROVIDED BY ANNEX RESEARCH, INC. CW CHART SUSAN ALD AM

Unipress rides the Unix train

BY ALAN ALPER

EDISON, N.J. — The gradual emergence of Unix as a basic market requirement is helping a small software publishing house position itself as a ope-stop shopping center for Unix-related programming tools, languages and applications

Unipress Software, Inc. was founded four years ago without the aid of venture capital by soft ware consultants Mark Krieger and Fred Pack. At that time. Unix was still the divine prove nance of computer backers and scientific and technical users. Like other Unix advocates at the time, Kneger and Pack pinned their hopes on expecta

tions that the operating system

Their optimism was fueled in part by the hope that AT&T the developer of Unix - would eventually be permitted to enter the commercial commuter hissi ness and would flood the market

with Unix systems. While the acceptance of Unix has been slow, Unibress has prospered by stick me to a conservative financial plan and focusing on what it does st: marketing products. Unipress says its guiding plu losophy is to leave costly software development to others Drawing from a wide range of

business applications, communications software, languages and tools from a phalanx of garageshop operations and part-time developers, Unipress publishes products that it has test-market

We do not take the rock the developer does," says Pack, Un-



presa's vice-president, "We find programs that are well-written and measure them against the market requirements. We offer

the author a market, technical support and 30 different machanes to test his program on Developers usually receive royalties of about 20% of the total sales of their products. Once L'impress publishes a software product at takes over responsibility for updating and enhancing that product. "Our technical department works with the author to do updates." notes Kneger. Unipress's president Unspress, which \$200,000 last year on revenue of about \$2 milbon, markets its

products directly to U.S. end us ers such as Ford Aerospace & Communications Corp. and Hughes Aircraft Co. as well as through distributors in Europe and Japan. The firm uses telemarketing and word of mouth to get its message out.

You're not talking about products with a \$20,000 price Continued on page 99

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Ex-supplier sues Iomega for \$8.4M

BY ALAN J RYAN

ROY. Utah — lomega Corp. has been slapped with another lawsuit. The financially troubled disk mass-storage product manufacturer is being saed by a former supplier, the Soin Physics.

division of Eastman Kodak Co.

The \$8.4 million suit, filed in
Federal District Court in Utah,
concerns an agreement between
Spin Physics and Jomega under
which the former was to supply

Iomega with head assemblies for use in its products. Spin Physics is calling for payment of cancellation costs, costs it incurred for parts needed to build the head assembles, startup costs, payment for delivered goods and other unspectfied damages, according to an Io-

mega statement. Spokeswoman Linda Dalton said that when the company made the agreement with Spin Physics in 1986, Jomega was projected to grow substantially.

Growth not seen
"We didn't achieve that growth,
so we didn't need the quantity of

head assemblies agreed upon," she said.

Dalton said the company was surprised to learn of the suit. She said forega had set aside funds

on in its reserves to work the con

"We were not disputing the terms of the contract, just negotasting with [Spin Physics] on the th, terms of the amount, and we of were still in the process of negotating when we heard about the

tating when we heard about the suit," she said. The District Court recently denied Kodak's motion for temnorary relief

Financial exec leaves Lotus fold

BY DOUGLAS BARNEY

CAMBRIDGE, Mass. — After 27 months on the job and participation in seven company or product acquisitions, E. C. "Mick" Prologis, cheef financial officer for Lotus Development Corp., last week announced his resigna-

last week announced his resignation.

A strong candidate to fill Prokopis's position has been identified by Lotus and may be close to being hired, but the commany did

being hired, but the company did not name the candidate. Prokops hopes to run a smaller company, or a department within a larger corporation, and intends to remain based in New England. "I have been in training

to run a company," he said.
The 44-year-old Prokopis
served during a crucial period for
Lotus. The firm had unsuccessfully attempted to wean itself
from a reliance upon Lotus's 1-23 for the bulk of its revenue by
creating new applications such

as Symphony and Jazz.

But reaking the strength of

1-2-3, the firm's core product,

Lotus embarited on a new strategy. Now, rather than creating
another his product of that magnatude, the firm is pontioning 1
2-3 as an operating environment
and surrounding that orce product with a variety of applications
that provide data, accessories, a
new interface and development

Much of this strategy has been realized through acquisitions. Prokopis has played a key support role in seven acquisitions of products or companies, one of which has yet to be completed.

Since April 1985, Lotus has

Since April 1985, Lotus has acquired four companies: Dataspeed, linc., Isys Corp., GNP Development Corp. and Graphic Communications, Inc. It has signed a letter of intent to acquire Computer Access Corp., Lotus has slos bought the partial assets of Software Arts, Inc. and the complete assets of Infocenter Software, Inc., "Il earmed quite a bit," Proko-

pis said.



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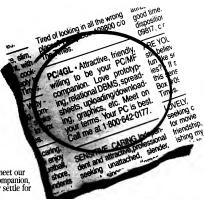
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decide which processing environment is best mainframe, PC, or a combination of both It's the personal computing

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MERGERS A C Q U I S I T I O N S

Nashua Coro, in Nashua, N.H., announced that it has completed the purhase of Lin Data Corp., a manufacturer of high-capacity rigid disks for storage of mouter data

Under terms of the agreement, Nashsa acquired all classes of Lan stock for approximately \$24 million in cash

Harris Corp. announced it has sold the components operation of the company's Microwave Semiconductor Division in Milpitas, Calif., to Litton Industries, Inc. in Beverly Hills, Calif The terms of the cash transaction

were not disclosed

The Harms Microwave Semiconductor division was composed of two operations: components and gallium arsenide integrated circuits

Data General Corp. has signed an agreement to purchase the technology assets of Easinet Pty. Ltd. in Sydney.

Data Ganaral and it has offered on ployment to most of Easinet's employees. The amount of the purchase was not disclosed. Easinet is a privately held software commany that develops and markets engineering data base and applications software packages.

Data General and Eastnet have had a ven-year business relationship during which Easinet has been a Data General OEM, independent software vendor and the developer of Data General's TO/3D engineering data base software.

Sungard Data Systems, Inc. and Devlin Associates, Inc. have reached an agreement in principle for Sungard to

actione Devim The planned transaction is scheduled for completion by June 30.

Devlin Associates is an independent consulting firm that provides planning and educational services in the areas of disaster backup and recovery, emergency preparedness and security planning.

Teaming up CONTINUED FROM PAGE 93

out of the computer industry, and every one recombled for a life raft. Announce: ments of byoffs came weekly, and chip companies found they had less and less to spend on research and development, which was supposed to get them back into the black.

Despite the computer industry's current resurgence and the resulting pickup of semiconfluctor orders, this is not exactly the tune for pink champagne

Jack Beedle, president of In-Stat which is a a highly regarded Scotts dale, Arız., industry watchdog, predicts U.S. chip sales will drop significantly in the second half of this year after a strong first half

One reason for this predicted drop is that while more than 100 new companies will be jumping on the IBM Personal Commater- and Personal System/2-clone bandwagon this year, and each will be ordering chaps for its clones, add-on boards. peripherals and other paraphernals. only a portion of those companies is expected to survive. This shake-out would brung a decline in chip demand, according to Beedle

Meanwhile, communications equit ment sales are hindered by the uncertain ty of Integrated Services Digital Network technology, still in the future Military orders for semiconductors are expected to slow as well, due to the current demand for cutbacks in Pentagon

As if that isn't enough, the U.S. economy is overdue for a recession, which would certainly affect any short-term growth of chin companies. Beedle notes that the current business expansion cvcle is 55 months old — by far the longest such economic cycle in peaceful times

These problems, along with the high ts of manufacturing and R&D and the need to strengthen U.S. industry against overseas competitive pressures, will shrink the number of worldwide semiconductor companies from 289 at present to about 100 by the year 2000, Beedle ates. Of that 100, 10 will be grants in the industry and the rest will be smaller. niche-oriented firms

You scratch my back . .

Thus, with continued uncertainty in the nast, strategic partnerships seem to be the only solution. Some and actor wanders are finding it fruitful to work together to take advantage of one another's technologies and capabilities. Why reinvent the wheel when you can swap secrets and share expenses?

Many of these alliances are with over eas competitors, illustrated by partnerships between Motorola, Inc. and Toshiba Corp. and National Semiconductor Corp.'s relationships with Japanese and French chin firms

These are not the best of times for U.S. semiconductor companies, and the glory days of the late '70s and early '80s may never come again. But after the anxiety and concerns from 1985 to 1986, at least now the sleeping CEO can catch a

few Zs between buzzwords. Martin is a Combuterworld West Coast corre-

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Unipress

Kneger says, "You can't send a alesman to sell products in the \$500 to \$1,000 price range

Unipress has also set up relanships with hardware manufacturers such as Convex Com-Corp. and Pyramid Technology Corp., which market Unipress products to their

The privately held company. projects profits \$300,000 on revenue of \$2,5 million for this year, says if hopes to reap the benefits of an apparent groundswell of support

Several commercial vertical markets, such as the brokerage and law industries, are embrac ing Unix's ever-expanding portfolio of business-specific application packages. Moreover, almost half the federal government bids for new hardware today require the canability to run Unix.

Torrid growth

According to market research firm International Data Corp. (IDC) in Framingham, Mass., the Unix marketplace is beginning to experience torrid growth Approximately 181,000 Unix-based computers of all classes were shaped worldwide last year, up more than 60% from 1985, according to IDG. The market is expected to grow at a similar clip this year, the market research firm projects.

Unipress's one-stop shopping trategy impresses IDC analyst Kate Komisky, "It makes sense, because a company with one or two products has a hard time getting going," she says.

So far, Unipress is best

known for its Emacs text editor the engineering community and government and educational anstitution sectors

Last March, Unipress decid ed to set up a service aimed at end users to port applications to the Unix environment. So far, that business has not grown as quickly as expected. Krieger says. The reason, he notes, is that large end-user companies at which the porting service is aimed - are slower to make derisions "The calls are coming in, and we're getting leads, but the real interest is coming from small software companies who have no money." Krieger says.

Although the Unix market remains somewhat fragmented, with various flavors of the oper ating system marketed by different vendors. Unipress says it staunchly believes that more and more users will gravitate to the environment because of its portability, multiuser functionality and networking capability.

The race is over and the technical users - at least have spoken," Pack says.

Sanctions cut

The SIA asserted that there is not sufficient evidence for any additional relaxation of the sanc-

What we seek, as do many members of Congress, is evidence that dumping has com-pletely ceased and Japan has

opened its market to all foreign manufacturers, as it agreed to do last year." Procassini said. lananese officials, who con-

were disappointed that the Reagan administration did not fully rescord the tariffs

Hajime Tamura, Minister of International Trade and Industry, issued a curt statement that said be appreciated Reagan's ac-

for "an early and total lifting of

Ought to be reworded Reagan said Nakasone "ought to

be rewarded" for good-fath efforts toward compliance with the U.S.-Japan senuconductor agreement. Cluef of Staff Howard H. Baker Jr. said the action should provide an incentive for

further improvements However, some Congressonal leaders who support tougher trade policies with Japan said they opposed the president's au

n Senate Maority Leader Rob ert C. Byrd (D-W Va.) said. "Tre gret that the president has decided to lift some of the sanctions on the basis of less exception dumping for a single month



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Here's the most reliable DEC-compatible terminal ever built. The TeleVideo 9220.

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Susan Kennedy is a product analyst at Leasametric, a company that rents, sells, and services DP equipment all over the country. Including thousands of terminals. And if reliability is important to the average user, it's critical to

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rigors of shipping, but the
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So before Leasametric approves one unit, they tear it apart piece by piece. And give if an evaluation that makes an MITeram seem easy by comparison. We talked to Susan recently, and these are just a few of the fluings she said:

"Tho many terminals just on't measure up...! Ye seen machiese with questionable ergonomics... keyboards that Res in the middle when you type... even cheap little dodes that could drop off... all these lactors continue to make a product you either want or don't want in your product little...

"But with Televideo, the whole product is well designed. They start with solid engineering, and follow through with every detail, down to the steel brace in the keyboard. Overall, they've built the same quality into the 9220 that's made all their other terminals last so long. Obviously, we want to make sure that, two years from own, our equipment will still

be working for us. That's why we feel so good about TeleVideo."

Of course, Susan is talking about quality and reliability. When you check the features you get for

the money, we look just as good. As you can see from the chart above, the 9220 gives you full VT 220 compatibility. A 14" amber screen. And the best thought-out ergonomics around, All for only \$619.

The FeleVideo 9220. If you'd like more information, or the name of your nearest distributor, call 800-835-3228, Dept 132. In the meantime, we'd like to leave you with a quote from Susan Kennedy. "Keeping customers happy is what my job is all about. And TeleVideo definitely makes my



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9220 KEY FRATI INTS

SUPERSHORTS

Mentor Graphics Corp. has filed suit against EDA Systems, Inc. of California and four termer Menter Graphics emplovees to enjoin them from sharing and using confidential information to the ben-

The sun also seeks damages estimated \$18 million as well as magnetions against EDA from hiring the former Men-

Amdahl Corp. recently announced the offering of 1.4 million shares of common stock at \$41 125 per share. Concurrent with this offering, the

or Graphics employees

company is selling 1.2 million additional

shares of its common stack to Fullitua Ltd., which will own approximately 46% of the company's common stock.

NEC Information Systems, Inc. (NECIS) announced the establishment of the Business Credit Program, a plan that allows authorized NECIS dealers and resellers to offer products on a lease basis

to corporate accounts. The NECIS Business Credit Program will be administered by Dana Commercial Credit in Troy, Mich., according to the company.

Ian M. Ross, president of AT&T Bell

Laboratories, is this year's recipient of the Industrial Research Institute

Medal Ross received the medal last month at the Institute's 1987 annual meeting. Established in 1945, the medal is presented by the Industrial Research Institute to recognize and honor outstanding leadership or management of industrial

research that contributes broadly to the development of industry and to the bene Ross was cited for distinguished leadship and dynamic management of

AT&T Bell Laboratories and for producing a steady stream of innovations in information technologies. He was also hon ored for vision in discerning trends in information sciences

Novell

CONTINUED FROM PAGE 93

full range of connectivity products, according to Novell President Raymond

Burton and Novell will probably take in approach similar to Apple Computer s. Apple has identified and sells di rectly to 75 key corporate accounts but also has a second program in which ac-

count representatives work with local dealers in other cornorate accounts. The decision to go direct — one that Novell resellers have long predicted and feared — is fueled as much by the increasing complexity of Novell's product offerings as it is by end-user pressure, according to Burton

Roise consciousness level

We have to raise the consciousness level of our major accounts as our products get more complex " he explained. Novell will also try to assist corporate users with long-term connectivity planning, he add ed Burton also said the first phase of Novell's Message Handing Service (MHS) will also the mosth and will retail for \$995. MHS development lots shipped in

Announced last fall, the initial version of MHS will reportedly use an applications interface to allow any two Microsoft Corp. MS-DOS 3.2 and MS-Net-based networks running the same application to exchange, store and forward messages on asynchronous telephone lines

Separately. Novell recently reported that sales for its most recent quarter ended May 2 showed a 106% increase over the like quarter last year. Earnings for the period were up by 66%

Good results The overall results were better than we

were looking for, both in terms of revenue and earnings per share, taking into account that they [Novell] had around \$950,000 of acquisition costs in the quar said analyst Frederick D. Ziegel of Needham & Co.

During the period. Novell acquired Santa Clara Systems, Inc. in San Jose, Calif.: CXL. Inc. in Palo Alto, Calif.; and Softeraft, Inc. in Austin, Texas.

The acquisitions are part of the compa ny's two-tiered growth strategy, accord ing to Ziegel. The tiers, he said, include lowering the price of networking prodacts to stimulate demand and enhancing the functionality of the personal computer network to the user

Ziegel said the CXI acquisition helps Novell provide communication between micros and mainframes and that the acquisition of Softcraft will allow Novell to furnish software development tools 'One risk in the growth of the networking business is whether or not the applica inns software development cycle can keep pace. If the applications software is not there, the potential network buyer will wait until those applications are available," he added.

Sales for the period were \$42.4 mil hon, compared with \$20.6 million in the smilar period a year ago. Earnings for the recent period were \$4.5 million, or 18 cents per share, compared with last year's \$2.74 million, or 11 cents per share. For its current quarter, Ziegel forecasts that Novell will have revenue of approximately \$46 million, with carnings of 23 to 24 cents per share.

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EMPLOYMENT TODAY

Arming for interview battles

Tips for getting what you want while still making a good impression

BY KAREN FORCHT



The classic military obrase. Nev er eo into battle unarmed. that should be beeded by data processing professionals con-

templating a job change Even experienced managers cannot rest on their laurels and safely assume that they will be hired just because they worked for several years in a large, sophisto, ated DP shop. They must be ready to face the newest op-

ment - the interviewer. Before entering the interview, one good way for DP profeedurals to arm for battle is to onduct a self-analysis. By taking inventors of yourself you can cam mucht into personal strengths weaknesses likes

This process can often be namiul, mostly because people rarely analyze themselves only others.

Authors Charles Steward and Intercreasing. Principles and Practices, suggest the following questions to consider in the preinterview self-assessment. · What are my personality, proand intellectual

strengths and weaknesses? · What are my accomplishments and failures. . What activities give me the greatest satisfaction

· What do I want out of a position now and in the future? Take stock of the market Along with self-assessment, you

should develop a resume strategy that matches your employment unals. To develop an effective strategy, you should take stock of the market and the company where you will be inter-

Whether seeking your first job, moving up in a similar job or hanging careers, answering the following questions can help to eliminate later frustration: . What is the future of this business, industry or profession · Is the industry concentrated

· How will new technology at fect this area? · Are you excited about being a part of this business or industry. If you don't know the anwers, you're heading into the

Take stock of the campany cufa, business before you send out a resume or fill out an apple cation form. For example, inves-

tigate these areas:

· Is the company growing or stagnant? . What is the company's position . Is the company's business phi

Invonly consistent with your · How do current and former employees feel about the compa-

The resume should be brief but long enough to give an ade quate picture of yourself. Over inflating your accomplishments tends to turn off the reader, and you may find yourself labeled overqualified for the job.

A good resume should de cribe succinctly the events work and educational experience that have shaped your life and hat nave shaped your me and haracter. These events should draw a perture of you in the read

Be creative in reflecting your performance ability. Too often, facts are stated so matter-offactly that the reader's only reactionis: "So what? Companies are very eager to hare a well-rounded person who

shows some life away from com puters. Offer some information about your bobbies, skills, interests and honors.

The interview can remiorce or nullify your resume. Be prepared for it by following a "preflight" check sheet before, during and

Before the interview, research the company, products or services produced, number of employees, types of positions. size, policies, salaries, benefits, length of time in existence, own ers, name of hiring personnel

Be prepared to answer ques-

LONG WITH selfassessment, you should develop a resume strategy that matches your employment goals. To

develop an effective strategy, you should take stock of the market and the company where you will be interviewed.

tions about your qualifications. eoals and interest in the company. Ready one or two questions m your mind that you might ask donne the interview Arrive appropriately dressed

Is the company conservative or trendy?). Your safest bet is to dress conservatively. Arrive approximately 10 minutes before the interview so that you can relax a little rather than rushing in During the interview, maintain good eye contact, particularto when the interprewer is asking a question. If you are uncomfortable staring into the interview er's eyes, pick a spot on the wall about an inch or two above the interviewer's head, and focus on the spot - giving the illusion of eye contact.

The interview often will begut with small talk. This early con versation is an excellent oppor tunity to show your friendliness. ability to speak well and your ourteousness. Watch for signs for when the small talk should progress into the "mest" of the interview itself. Let the interviewer guide you. Do not ask questions too soon

about salary. That part of the job should be discussed at the end. A safe way of learning about the salars is to ask for a range, not a Ask ouestions about training, proportions and benefits You

need to portray yourself as a nerson interested in a career, not self that the interviewer may not

ask but that you feel is important, such as your attitude toward work and how well you work with others. After the interview is over.

make a list of pres and cons of the interview. Use this analysis in developing your skills and comfort level for the next encounter Information and Decision Sciences De-

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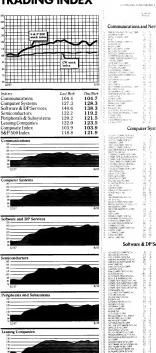


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Aug. 3	Communications Software	Sulv 17
Aug. 10	DBMS for Large & Medium Scale Systems	July 24
Aug. 17	field bersice	July 31

STOCK TRADING INDEX

Computerworld Stock Trading Summary







Semiconductors

Got a parachute?

Investors bail out on DCA after revenue drop predicted

Investors, already jittery about the global economic situation, were not in a forgiving mood when they heard bad news last week from Digital Communications Associates. Inc. (DCA)

The Norcross, Ga.-based vendor of mi cro-to-mainframe products experienced a massive self-off of its shares in over-thecounter trading Wednesday after announce ing that revenue in its current fourth quarter will fall 12% to 15% short of third-quarter levels DCA stock plummeted 1114 points to 3614 as 3.6 million shares changed hands. making DCA the most active stock on any

market that day. Following the typical pattern after a maor drop. DCA rebounded slightly on Thursday gaining 2's points to 38'

Investors have also been jumping off the Microsoft Corp. bandwagon, partially due to uncertainty about the market success of IBM's Personal System/2 Microsoft feil 6 points Thursday to close below the 100 mark for the first time in several weeks at 971. Microsoft, which has traded as high as 128%, lost 11% points in last week's first

four days ading CLINTON WILDER

Shunning MIS

arroand the country and discov-

ered several critical challenges

officers and universities

thrive, a majority of the MISprocore - st - Tuel State choirman of New York University's information systems area. "But a tot of good sobs in MIS are go Computerworld recently interviewed leading MIS educators as well as MIS managers

grants across the country have program in MIS at Dartmouth College in Hanover, N. H., for example, was recently killed be sause of lack or student interest and funnical backing from the land. Babson College in Wellcoles, Mass., witness devastating declines in MIS en rollment' during the past three

ears, says Leske Ball, director

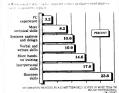
MIS majors - continue to

Computer science graduates: How their bosses see them MIS departments continue to have heavily from computer science

departments, but these graduates sorely lack several key shills

· When a destribe importance in the tollowing skills for recent graduates

	Ven important	Important	Somewhat important	Notatall	
Technical suils	18.1%	43.8%	7.3%	0.4%	
General business skills	20%	55.3%	21.9%	2.7%	
Interpersonal	31%	41%	7.9%	-	



ox luthrug the following. · Although up to 70% of the nation s business schools now offer as oncentration in MIS, the best and the brightest students are opting for majors in finance. drawn by the lure of huge sala nes and the Jugh-powered life

at vie of Wall Street · Corporate MIS departments are seeking a balanced mix of technical and business acunion in turing today. But the reality is that computer science grady tend to be too technically orient. ed, and MIS majors in business schools do not have the solid technical grounding required Attempts to create a curniculum that provides the perfect match have met with limited success. · A UCLA study shows that treshmen interest in computer careers has dropped dramatically since its peak in 1982, falling from a high of 8.8% in 1982 to rust 3.5% in 1986.

 While some programs — nota bly Georgia State University in Atlanta, with more than 1,500 of the school's MIS program · A Computerworld survey of more than 700 MIS profession als revealed that nearly 40% of the respondents felt computer a poor to-fair job in training students for MIS careers · Finding qualified faculty to

teach in the MIS programs remains difficult, and there continues to be just one qualified candidate for every three positions across the country s'arraculum and teaching meth-

ods vary so dramatically from program to program that corporate MIS departments are hardpressed to know just what they are getting when hiring recent · Curriculum in both MIS and

computer science is not keeping up with the vast and rapid changes taking place in the infornation systems world. A recent report on MIS curriculum condes that "MIS curriculum and computer science programs as well, in many cases have not produced qualified and employable anadoptes for houness ensa-

The lure of Wall Street Although the very healthiest

MIS programs at schools such as the University of Arizona at Tucson the University of Minnesota Minneapolis and Georgia State continue to attract plenty of applicants, the jury of Wall Street is taking a toll at a major-

When I look at the kind of bright people who were entering our field five years ago and are not anymore. I ask what's happened to cause this decline." McLean says. "The first one is clear. The action is in finance. It to sucking up people even though they all can't be placed. The number of sohs in MIS is four times that of figuree, but those \$60,000 or \$70,000 starting sal-

arres dazzle them Students are not the only mes fonging for the sax-figure potential Faculty and potential facults are opting for other All's program at Arizona, abserts that the salary gap between academia and industry is closing tast and resigts out that a starting as estant professor can expect a \$45,000 nine-month contract

tract of another \$15,000. Michael Lawson, director or Boston University's master of science in MIS program, agrees the gap is closing but points to a young faculty member who recently left campus for a financial position in New York, a sobstart

ing at \$150,000 You are asking students and

faculty to be profit-oriented because they are here in the busi ness school and they say. I see the biggest profit in going else-McLean says In addition, the widely publi



amp proved

vastating to MIS program IBM, for example, reportedly hared 6,000 college grads two years ago: That figure dropped to 1,000 last year and to virtually none this year. Although compa mes mother industries are besting down doors to find quality MIS people that message has pers of doors within the industry stself. And although the need is great in MIS, the profession lacks glamour, and salaries have

A dearth of computer science and MIS graduates in the Southwest for example has lead to the formation of a 60-member corporate cooperative in Dallato try to attract graduates from other regions to come work in We formed the co-op to a

on a united front to attract DP talent to this area," says Richard Bell, staffing manager for high tech consulting for Arthur Young in Dallas "When the oil glut but here, it really hurt the MIS profession

The schools that have established close ties to the local corporate community and draw on those ties for counsel and future employment tend to have weath ered the early storm clouds of thry crisis (see story page 121).

Most of the successful pro to advise both faculty and stu dents about MIS needs. Many lo cal companies provide internship or co-op programs for students who can use that experience to find jobs with that company upon graduation. Working with local usinesses, however, can be a mixed blessing. McLean points out that if husinessmen are taking the time to advise they expert to be listened to and MIS programs are hard-pressed to acommodste all recommenda-We have some spirited

meetings in which we discuss how much programming, boy much technology as necessary M. Loren property. "And un-MIS guy will say. These people will be assistances, but I expect them to be competent Cobol programmers; our whole shon is Cobol, and if they are going to man age Cobol programmers, they should be able to do anything they ask their subordinates to do 'Now, I know of two firms.

Grants help tailor MIS grads

he current crisis in MIS education was not totally unanticipated, IBM, for example, noted three years ago that MIS education was facing a quandary, so in 1985 the firm provided \$27 million in grant money to 13 graduate schools of business to foster programs in MIS. The company currently encourages its own MIS professionals to gain visibility and promote the profession on campuses around the country

IBM, under the guidance of Charles Bowen director of plans and program administration foresaw this impending problem in the early 1980s, even as interest in comp was swelling. "We could see that MBAs didn't understand systems and computer science ma jors didn't understand management and busi ness." Bowen says, "In 1983, we decided to hold a competition for graduate schools in this

Promising \$27 million in grants and equipent, Bowen and his colleague John Navden, an IRM consultrat, met with human a school deseraround the country in 1983 to discuss needs and concerns about MIS education. "People figure that we know something about this." Bowen says, "so we hoped the grants would legitimize this area of teaching a bit

Bowen and Navden realized that a large, unfilled gap existed in this academic discipline - there was a 10-1 ratio of tenure track openings to qualified applicants in MIS at the time - and the grant program could help alleviate some of the problem. IBM received 212 applications gave out 40 planning grants and then awarded the 13 major grants in 1985. While the IBM awards have sumificantly affected the schools that received them, there is more than a bit of from in the newly created relationships. According to the University of California at Los Angeles's Ephraim McLean, IBM's own MIS on bires only computer science graduates. We meet with an IBM MIS rep twice a year

d they tell us they need better people McLean says. "So we ask where they get then people and they say 'computer science departents.' And maybe they are looking under the wrong rock. They should be hiring from the very business schools they just finished funding IBM does here lots of our grads, but they go in as sarketing reps or systems engineers, not into IBM's own MIS function."

Dnn Rully, IBM's director of information systems, acknowledges that the company tradtionally hares computer science majors. "The MIS graduates haven't been there, the num-bers were very limited," he says. "It's only recently that the programs have started turning out people we can hire."

GLENN RIPKIN

both good friends to UCLA and leading employers, who will not hare our grads because they have insufficient technical depth.

In addition, the proliferation of microcomputers in both high schools and colleges has dramatically changed students' perceptions about computing, produc ing a cocksureness that an understanding of basic personal computer packages insures an ability in run any type of MIS

We do see that some employers view MIS as a vanishing skill because all business grads will know more about comput-



ers," says David Naumann, director of the MIS program at the

University of Minnesota Naumann's colleague, lim Wetherbe, who runs Minnesota's MIS Research Center, adds that there is confusion among employers as to what they are looking for from universities

We periodically survey For tune 100 companies and ask what they are looking for in an MBA for MIS," Wetherbe exelains "And there is a lot of confusion out there about whether they want a computer science erad or an MBA with a concentration in MIS. There's a definite overlap, and that causes confu-

Adding to the problem is the fact that the study of MIS in academia has just recently come of age. In fact, that study closely parallels the development of the eld itself, and therein hes much of today's confusion and uncer tainty surrounding the academic discipline

We constantly have to remember that this course of study is a baby," Lawson says, "Let's not ask it to behave like a 200year-old discipline

Those who con't? From the computer science

point of snew there is also the perception that MIS is an undefined occupation. Stuart Reges. assistant chairman for education in Stanford University's department of computer science, points out that the perception is that "people in MIS are just not quite good enough technically. Reges, who counsels undergrad omputer science majors at the Stanford, Cald., university, says. he would not recommend a nath into an MIS program, "I'd rather recommend a computer science undergraduate degree along with a general MBA," he says, Or I'd suggest studying software engineering on a graduate level. The future of MIS is sim-

ply not clear; programs like that have trouble finding a home Indeed, while many computer science majors eventually find themselves working in MIS as programmers, the far more attractive put of gold for them bes in development work for leading

computer manufacturers such as IRM Digital Fournment Corp. or Apple Computer, Inc. We keep seeing a very beavy technical engineering orientation in the computer science grads," says Mike Heschel, corporate vice-president of infor-

nation resources for Baxter Travenol Laboratories. Inc. in Deerfield, III "The curriculum tends to be too technical. That's fine if you want to design com puter systems, but MIS doesn't necessarily need that skill

Curriculum, in fact, constitutes a major focus of concern in this current crisis. Unlike ageold disciplines such as math, the rapidly changing high-tech envi rooment renders many MIS courses obsolete in less than five years. Within rigidly structured academic departments it is sometimes extremely difficult to implement such changes, and even if that is possible finding savvy faculty to teach the new courses presents another high

harrier to clear Several organizations. as the Data Processing Manage ment Association and the Association for Computing Machinery have for many years offered an outline for a model curriculum in

The model curriculums offer a varied mix of technical and business courses. But, according to Professors Andrew Tar-gowski and Judy Yaeger of Western Michigan University and Donald Carr of Eastern Kentucky University, that model is rarely more than an unattainable goal for most business schools. For those colleges which are

accredited by a board, there is already a rigorously defined curnculum required as part of the business administration degree. which leaves only a limited number of credits left for work in the major area of concentration," Targowski, Yaeger and Carr wrote in a recent report on MIS. curnculum

And program directors agree that the very nature of the field makes MIS as an academic discipline "mushy" and difficult to research It thus draws scorn from other academic departments. and committing to such a course of study far both students and faculty is considered risky. At most universities, tenure approval as well as the initiation and expansion of new programs is dependent on faculty committoo. These committees are of-

Where MIS is still the BMOC

espite the evidence of declining interest in MIS among America's college students, several MIS programs continue to thrive. At MIT, for example Tom Magnanti, the George Eastman lessor of management science, insists that MIS is among the most popular areas of concentration at the prestigious Sloan School of Man

The MIS program at the University of Arizona, under the management of 1 F. Nunamaker, offers a full contingent of concentrations: an undergraduate degree two master's degrees (an M.S. and an MBA) and a Ph.D. The area of study is so popular, according to Nunamaker. that 3,600 business students annually take an introduction to information systems course. The Ph.D. program received more than 200 applications for 10 positions open

for the 1986-1987 academic year Undoubtedly, however, the most successful MIS offering is at the College of Business Administration at Georgia State University in Atlanta. In an era when the number of annications to MIS undergraduate and graduate-level programs is dropping significantly, the Computer Information Systems program at Georgia State

boasts more than 1,500 MIS majors on campus. According to James A. Senn, chairman of the cumputer information systems department, the school has 800 undergraduate majors, 700 mas ter's degree aspirants and 29 doctoral candidates in MIS. In addition, the department offers 25 different courses in MIS with 21 full-time faculty members, which is more than any other

program on campus offers. The 22,000-student university, according to Senn, is dominated by the business school, and in turn, "MIS dominates the business school Senn says he believes there are three critical

reasons for Georgia State's success in MIS 1. Interaction. There is significant and far Computer Information Systems program reaching interaction between the MIS program

2. Research. There is an emphasis on MfS

3. Support. The program enjoys "tremendent is a masse cheerleader for our program Senn says. "The university is willing to put the Inecessary I resources into the program to make

at work

Senn is credited with brings the Georgia State program togeth er during the past four years, answering the question of whether it should be more technical or more Though management-oriented some business school MIS directors dismiss Georgia State's department as simply a clonfied programming school, Senn disagrees."

ed we could do both quite well, and that's what we've focused on." he

According to Ephraim McLean of the University of California at Los Angeles's Graduate School of Management, the secret of Senn success is in the fact that the program is a sepa rate department within the business school rather than just an area of concentration for all MBA candidates to consider. "He has an appro-priate model there," McLean explains: "Industry can look there and know that each graduate has Itakenl Enbol and data base management and a series of course offerings geared to MIS They know what they are setting when they

hire one of his grads Senn takes it a step further. Because the program is a well-supported one. "we don't have to constantly justify our existence like other pro-

grams do," he says And most of all, the program fosters a strong and cooperative relationship with local busness. "Atlanta is our campus." Senn save we are putting together a special board of advisors from the business cummunity just for the

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ten unwilling to commit rediscriptines such as MIS. Young faculty are finding it a rocky road to tenure or full professorship in an MIS concentration and therefore opt for more established programs in which they can concentrate on building their research credentials.

At Stanford University's prestigious Graduate School of Business for example there is little emphasis put oo MIS as an area of study, accurding to Charles Bunini, professor of management science. "I'm embarrassed when people ask me about it because I believe MIS is important, and I think we should do more. But our tenure track is dominated by research activities and contributions, and the re-

search effort in MIS has simply not been there," he says. "We set up our program as part of liberal arts, and it just didn't belong there." says Tom Kurtz, chairman of the computers and information systems program at Dartmouth College, a program that will rease to exist

next year. "The business school gram and didn't recognize information systems as an important ingredient of the school."

MIS is facing the same thing that operations research faced 25 years ago," adds William Dill. president of Babson College, a small business college outside Boston, "Operations research was supposed to provide a relevant set of tools to management provide an avenue to jobs, and there were promoters on the faculty nushing the program. But it contrared out as an arademic area because it was difficult to quantify, and the electives that made up the field gradually melded into other disciplines. That may happen to a degree with

The directors of MIS programs around the country disagree. MIS is, in their minds, a critical avenue of study. But they understand the realities of academut and urge persistence and patience. "MIS departments across the country have difficult times fitting into business schools.' Boston University's Lawson says. "It is considered too technical or just another way of teaching policy. That's why for schools that are serious about this it takes creative manage

ment, careful leadership and an ability to realize that this might be a little messy and painful but a willingness to wade manyway Lawson expects to see a shakeout in the education community to mirror the shakeout in the computer industry of the past few years "You'll see some schools try to get into this area. and you'll see other programs he says "But what will be successful is very simple. You have to have a substantive multiprogram approach to MIS education - not a ungle program trying to meet all the needs. The

programs must be relatively odest and can't be thought of as a panacea; and they must have focused agendas to meet the real needs of the business communi ty. That's the approach that will ultimately pay off Next week What the corts

PS/2 orders surge

Model 30 is big favorite among dealers

IBM dealers have been ordering IBM Personal System/2s in liner numbers, according 5(R) computer stores conducted by IMS America Ltd. in Ambler, Pa The survey however, did not indicate the sell-through rate

The survey covered the entire month of April - the hest month the PS/2 Models 30 and 50 shipped. The Model 60 was also covered although it did not ship in April Of the PS(2 line, the Model

in was the merwhelming fa-Diskless PS/2

American Airlines will use a on al-area network (LAX) (sed to a tile server running Novell. In. . file server operating yes

tern a your exhibit to both firms The thickes Model 30s boot IBM host computers through the host gateways that will reside on the file server While American's application is

based on IBM > PC-DOS, it does require host data access The diskless personal comouter is a fairly new concept that reusingly suphisticated PC based life servers. Firms such as Temp Corp., Santa Clara Sys-tems Inc., NCR Corp and Earth Systems currently offer diskless PL - to corporations differested

m intelligent workstations with

The Model 30 - Interneed at \$1,695 but available to large ornorate accounts at volume dos comes of as much as 40% or would in a diskless version alin DP MIS to control the data and apply atoms that and users as ess from a bost computer. Despite the advantages of a diskless Pt. there are also draw-An office automation

vorite of dealers, with a proso fed \$22,382,000 worth of the machines ordered. The Model 30 also commanded 18% of the dollar volume of all 16-bit machines ordered by dealers in April, the survey

found The PS/2 Model 30 had a 9% share of dollar volunes, \$11,526,000 worth of the machines were ordered The Model 60 had a 6% dollar hare, with orders totaling \$7,415,000, the survey said Compaq Computer Corp.'s Deskoro 286 had an 11 a dol-\$2 227,000

manager for a corporation that buys large volumes of micros changed that a PC with no break storage runs contrary to the whole thrust of personal comnature, which is to provide the end user with independent consputing power

But for highly specific applica tions such as an airline reservation system of insurance agenctes, diskless PCs provide access to host or file-server data while mouring data integrits

'Are they a good thing?'
Robert M. Metcalf, charman of Com, claimed last week to be

debuhted that IBM is offenne a diskless workstation, even if it is not offered through IBM's entire argument of late (against diskless workstations has been: 'Are they a good thing? The IBM stuff is helpful," said Metcalf. adding that it will come down to whose product is better

According to Metcalf, the ma jor reason for having an intelligent work-tation, as opposed to a terminal, is to run PC applica-"Lotus (Development Corp.'s 11-2-3 runs on our 3Station It down't run on History Equipment Corn.l VAXs or

[IBM] System/36s," Metcall said "Another reason is price/ performance. According to Metcalf, disk less PCs on a LAN can provide as much as 10 times better prices performance than a host-based network of terminals

Bounday its limited the 35.5 diskless workstation, the Model 30 is also finding its way into some corporations as a full-featured desktop system. These inroads are being made despite widespread market perception that the Model 30 is a low-end machine suitable for home and

In fact, the machine has been nticized for its low-end Intel Corp. 8086 nucroprocessor winch will not allow the Model 30 to run IBM's OS/2 operating system when it becomes avail able next year. As a result, some in the industry have called the Model 30 a dead-end machine

OS/2: Not for everyone

But not every user needs to run OS:2, an expensive operating system that will require new applications software, large random-access memory, a hard disk drive and an Intel 80286- or 80386-based machine For many corporations, ter-

unals are no longer appropriate for distributed applications that are being implemented, and a low-end replacement such as a Model 30 is the perfect solution A ciencal person doesn't need an IBM Personal Computer

said one DP project manager at a large corporation who noted that the Model 30 is an terminals. The manager said he is mainly purchasing Model 30s with one floppy drive and a 20M bute hard disk. He said he does not have any inclination to move towards diskless version.

Ace Hardware Corp. is anoth er Model 30 customer. "We are not looking to replace terminals at this point, but we are buying Model 30s and 50s" said Don Schuman, manager of informa tion systems for Ace Hardware Ace is purchasing Model 30s larger quantities than the more sophisticated Model 50 as a replacement for IBM PC XT

nurchases and is not currently interested to diskless worksta tions. "The Model 30 is a lot faster than the XT and costs "Schuman said Senior Editor Ed Scannell contributed to this report.

Too cold in the Northeast? DEC Vice-President Jeffrey C. Kalb, a top engineering executive who managed the development of the Microvax II, will leave the company this

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week. A sox-year DEC veteran, Kalb intends to pursue a general management position with a smaller company or start-up, a DEC spokesman said. He is considering a return to the West Coast, his former residence The times they are a-changin'. Formerly loss-plagued Hogan Systems, now profitable and happily ensconced un-

der IBM's marketing wing, is fast becoming the preferred employer in banking software, according to industry sources. Hogan is reportedly fielding resumes from professonals at SEI, Electronic Data Systems, Martin Marietta and, to no one's surprise, Uccel, SEI and Martin Marietta are both former employers of Hogan CEO Larry McTavish. who last week rose from president to chairman in recogni tion for engineering Hogan's turnaround

SAA-v it is so! According to preliminary Systems Application Architecture documents, RPG 3, the programming lan-guage used with the IBM System/38, will be the fourth programming language included under IBM's SAA. The other languages are Cobol. Fortran and C. The language used to program System/36s, RPG 2, is not mentioned in the docu-

I've got a bridge in Brooklyn . . . Those who believe a vendor's marketing budget is often a black hole received some real-world evidence last week when NCR sued one of its former advertising managers and three marketing firms for fraud. NCR charged that the manager induced the compuny to, among other things, pay \$266,000 for 20 market research studies it never received and \$260,400, or far above market value, for promotional calculators and tape recorders. NCR is seeking triple damages of \$900,000

No comment. The dry spell of Apple Macintosh SEs the last couple of months was caused, one corporate accou has been told, by Apple's underestimation of demand for the hard disk-based version of the system. Apple told the user if anticipated a high demand for the floppy disk-based version of the system and set up its manufacturing facilities to pro-duce them in volume. Swamped with orders for the hard disk-based version, the company had to cease manufacturing to change operations to produce the hard-disk systems Asked if he was surprised that Apple did not better antico pate demand for the hard disk-based system, one MIS manager said no. "You have to remember Apple is still oriented to the low end of the market," he said.

We stock restock. Two dealers last week said IBM of fered to wave the 5% restocking fee on PC ATs, making it easier to return the machines and presumably restock with PS/2s. Both dealers and customers also reported last week that IBM is offering appressive discounts of 40% to 45% on PS/2s to corporate customers ordering in large (more than 1,000 units) quantities. IBM did confirm last week it has stopped taking orders on all but two models of its older line, the PC AT 339 and PC XT 286. One Computerland dealer said, however, that IBM told him it would stop taking orders in the AT 339 once the company started producing the PS/2 Model 60 in volume sometime this summer

Not waiting for Godot. Assa Software hopes to exploit the protected-mode capability of Intel 80386-based mathines by the end of the year. Rather than waiting for OS/2, IBM and Microsoft's protected mode operating system for intel 80286 machines, Ansa has turned to tools from Phar Lap Software and Softguard Systems that will allow Ansa's Paradox data have to exploit memory beyond 640K bytes On another front, Ansa is slated to announce Tuesday a joint marketing relationship with 3Com, under which cu of 3Com's LAN product will receive discounts on the new multiuser LAN version of Paradox

Ready to lap the field. Samsung Semiconductor and Telecommunications is expected to ship a laptop computer with a 16-MHz Intel 80386 processor late this year or early next year. No formal price has been set.

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